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ABSTRACT

This document contains the following papers on educational leadership from the SITE (Society for Information Technology & Teacher Education) 2002 conference: (1) "Personality Assessment of Educational Leaders via Technology" (Pamela T. Barber Freeman and Michael L. McFrazier); (2) "Contributions and Concerns of SITE Participants: A Survey of Technology Using Teachers Educators (ASTUTE)" (Niki Davis, Polly Mumma, Deborah Sprague, Elizabeth Riddle, and Lucretia Carter); (3) "Leading Change in Utah Schools with Technology: The T-PLUS Project" (Dan Eastmond and Marti Garlett); (4) "Technology Leadership: Shaping Administrators' Knowledge and Skills through an Online Professional Development Course" (Peggy A. Ertmer, Hua Bai, Chaoyan Dong, Mohammed Khalil, Sung Hee Park, and Ling Wang); (5) "PT3 and T3L-- Teaching Tomorrow's Technology Leaders: Preparing School Leaders To Use Technology" (Ian W. Gibson); (6) "NCATE Electronic Document Center and Beyond..." (Bob Goeman, Neal Topp, and Paul Clark); (7) "Computer Database Model To Teach Legal Issues in Principalship Program" (Lawrence T. Kajs, Linda Grim McCormick, and John M. Deeman); (8) "Preparing School Administrators To Be Technology Leaders" (Don Knezek); (9) "Teacher Change Processes and Student Products of Exemplary Technology Integration Sites in Kansas" (Marilyn May); (10) "Developing a Relevant Technology Course for Administrators" (Barbara K. McKenziand Nancy G. Mims); (11) "Understanding the Role of School Leaders in Realizing the Potential of ICTs in Education" (Thomas L. Otto and Peter R. Albion); (12) "Disinformation, Academia, and the Web: The Anonymous Battleground" (Thomas Rakes and Glenda Rakes); (13) "Implementation of Information and Communications Technologies in Australian Schools: The Perspective of the Principal" (John Schiller); and (14) "Project Management: From the Perspective of a Graduate Student" (Ling Wang). Several brief summaries of conference presentations are also included. Most papers contain references. (MES)

Educational Leadership (SITE 2002 Section)

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EDUCATIONAL LEADERSHIP

Personality Assessment of Educational Leaders via Technology

Pamela T. Barber Freeman, Ph.D.

Michael L. McFrazier, Ed.D.

Prairie View A.M. University

Department of Educational Leadership

After almost two decades of school reform efforts in America, there are still millions of children being left behind. Specifically, the Texas Public Schools Statistic (1999) indicates that African American students comprised 18.7% of dropouts while Hispanic Americans made up 51.3%. According to research, one reason for this failure is due to the quality of leadership as well as the lack of sensitivity to the cultural dynamics within our nation (Wallace-Reader's Digest 2000; Astin & Astin 2000).

There is a critical need for educational leaders to develop a keen understanding of the challenges faced by students. Today's students' come from a variety of cultures, religions and economic levels; consequently, arriving to school at different ability levels. In addition, environmental conditions may have circumstances that challenge students' time and attention that could or should be devoted to learning. To cope effectively and creatively with these emerging trends, future leaders will need to possess new knowledge and skills as well as displaying a high level of emotional and spiritual wisdom and maturity (Astin & Astin 2000). As the public sector becomes more sophisticated, as well as impatient, critical questions are being asked and stringent limitations will be placed on institutions of higher education. Institutions of higher education play a major role in developing and shaping the quality of leadership in modern American society (Astin & Astin 2000). Thus, it is imperative that institutions of higher education begin to develop a conceptual framework to train and support leaders who will expand the variety and character of their school district's educational programs. After all, it is character, not money that fosters prosperity.

The face of our society is literally being altered due to the tremendous changes in the economic, educational, and demographic forces. The rapid change in the demographics of the United States has made diversity one of the most significant social facets of our society. Due to differential birthrates and immigration patterns, America is experiencing a major ethnic shift with increased numbers of African Americans, Hispanic Americans, and Asian Americans becoming more evident within our schools. In Texas, African Americans and Hispanic Americans youth constitute 53% of the school age population and have the highest dropout rate of any other ethnic group within the state. In postsecondary institutions enrollment of the diverse groups are declining. With the continuous increase of a diverse population, it becomes quite apparent that the dynamics of the culturally heterogeneous world have become both complex and problematic. In fact, one of the most compelling needs of our time is to reach for the "forgotten half" of our population who have the capability of leading but are being left behind by the new economy. Specifically, educational leaders do not begin to reflect public school diversity with only 12% of the nation's superintendents being female, and only 5% being people of color. In addition, leadership positions are expected to increase by 16% by the year 2008, making it the largest increase of any other major occupation (U.S. Department of Labor, 2000). Thus, creating a greater need for more inclusion of all ethnic groups who have the theoretical and methodological tools to help frame and answer questions that concern all Americans. Accepting the premise that higher education is the pipeline for developing productive citizens, academia must take the opportunity to lead the way and demonstrate to the rest of the nation how to accept and nurture a

diverse community of leaders. Consequently, the question is whether institutions of higher education are up to the challenge of meeting the needs of this diverse population. Therefore, it seems practical as well as necessary for those institutions (HBCUs) that are graduating the largest numbers of diverse students to become an active and viable component in developing leaders, in reforming curriculum standards and providing training for personnel who will lead and educate America's future citizenry. Because education is a continuum (not just K-12), it is imperative that programs/institutions that educate and train pre-service and in-service leader become active with educational reform. Since HBCUs facilitate the largest numbers of diverse leaders on the educational continuum, there are needs for leadership centers on HBCU campuses to provide our nation and the world with leaders equipped with new knowledge and strategies for educational reform.

During the sixteenth century, Martin Luther is noted for stating, "...when a man knows his own heart, he knows the heart of other men." Specifically, if educators have a strong grasp of their attributes, learning styles and personality preference they become more intoned to their students regardless of ethnicity. Consequently, this research was based on the above premise in order for future educational leaders to reach their educational, professional and personal potential, they must be actively involved in developing and implementing instructional models. The primary outcome sought through this research was to promote what Franke, Carpenter, Fennema, Ansell, and Behrend (1998) call "self-sustaining, generative change." Self-sustaining, generative change is when individuals make changes to improve their methods of leadership and instruction to ensure continued growth and problem solving. To ensure that self-sustaining, generative change is on going, a personality assessment was conducted. One's personality is without question the most important driver influencing career choice, relationships, health and sense of well being (Shaughnessy, 1998). To understand the full potential of one's personality, it is critical to first measure and then gain insight into your strengths and developmental needs through examining the results of personality.

Advanced Information Technology Training for Teacher Leaders: Hong Kong Experience

Wen-Hao Chuang

Dr. Wen-Hao Chuang was a lecturer in the Multimedia Innovation Centre at the Hong Kong Polytechnic University and now he is teaching at Hong Kong City University Master of Communication and New Media Program. Address for correspondence: Department of English and Communication, City University of Hong Kong, Email: enwen@cityu.edu.hk

Abstract

This paper describes the design and evaluation of the recent advanced information technology teacher training which is a multi-millions project provided by the Hong Kong Polytechnic University for the Hong Kong SAR Government. This training program is a team project contributed by department of electronic and information engineering, department of computing, educational development center, and multimedia innovation center in Hong Kong Polytechnic University. In 1998, the Hong Kong SAR government published a document of five-year strategic planning for Information technology (IT) in education. The three domains of IT in education includes: (1) IT as a productivity tools (2) General integration of IT in education (3) subject-specific integration of IT. In this document, the HK government also defined four levels of IT competency for school teachers. They are: (1) Basic level (about 18 hours of training, focus on basic computer and IT skills), (2) Intermediate level (about 30 hours of training, focus on intermediate IT skills such as using Flash, Internet search engines, etc.), (3) Upper Intermediate level (about 30 hours), and (4) Advanced level (about 120 hours). This presentation will introduce the current status of the advanced level training, share with the audience with the course design, implementation, comments and feedback from participated teachers, and some reflection.

Building an Online Tutoring Program: A Blueprint for Success

Richard Cortell, Cortell PCS, US

Many administrative decision-makers in higher education must deal with the results of the ongoing proliferation of instructional technology systems at their institutions. The result of this dynamic technological climate and the demands of "education consumers", and the job market, is that these administrative decision-makers fall into the uncertain trap of needing to approve the expenditure of tens, perhaps hundreds, of thousands of dollars on equipment and services they may know little or nothing about. These people need accurate and useful information in order to make sound decisions. In the case of online tutoring they need at least a basic understanding of the hardware, software, delivery systems, costs, personnel, and the myriad of other items required to develop and operate such a program.

The reliability of information upon which this understanding is based is critical. It may well determine the eventual success or failure of their program. Administrative decision-makers are often faced with the prospect of having to rely upon inexperienced peers and over-eager sales people for advice and guidance when making decisions about instructional technology implementation. If this is the case, they ask, where can they get the reliable information they need to make these important decisions? Fortunately, there are other accessible sources they can use to gather needed information. These include the Internet, articles containing the recorded trials and errors of other institutions of higher education, paid consultants, workshops, and presentations like this. What is extremely valuable and useful is an understanding of the process of conceiving, developing, and operating an online tutoring program, a blueprint for success, if you will. The presenters use the examination of this process as a catalyst for thought and discussion on the topic and a means of providing education administrators and decision-makers with some insight and information that will help them better understand the issue when they are required to make decisions related to implementing online tutoring programs at their institutions.

This presentation provides a glossary of many of the terms, and an outline of the needs and activities required to plan, develop, and operate an online tutoring program. While it is not complete in every detail, it provides decision-makers with a starting point and enough information to ask intelligent questions. First, we will examine the shift from the elite to the universal system of higher education in America. Next, we will examine the role and definition of technology within higher education and how its dynamic nature has given rise to the popularity of online instruction. Then, we will examine how the development of online courses led to the addition of online tutoring. Next, we will examine the reasons it is important that administrators and decision makers within higher education need to understand basic needs of an online tutoring program before implementing their own. Finally, we will outline the major steps involved in conceiving, developing, and operating an online tutoring program.

ABOUT THE PRESENTERS

Lena Bakir is the Special Needs Tutorial Advisor of the Tutoring Center at Bergen Community College in Paramus, New Jersey. She is a doctoral student in the Higher Education Administration and Supervision program at Seton Hall University, New Jersey. She can be contacted at lbakir@bergen.cc.nj.us.

Richard Cortell is an Information Technology consultant for practitioners and administrative decision-makers in education and industry. He can be contacted at rcortell@warwick.net.

Richard Ranker is the Director of Academic Technology Support at East Tennessee State University in Johnson City Tennessee. He can be contacted at rankerr@access.etsu.edu

Contributions and Concerns of SITE Participants: A Survey of Technology Using Teacher Educators (ASTUTE)

Niki Davis and Polly Mumma
Iowa State University
Center for Technology in Learning and Teaching
Nedavis@iastate.edu, pollym@iastate.edu

Deborah Sprague & Elizabeth Riddle
George Mason University
Graduate School of Education
Dspraguel@gmu.edu

Lucretia Carter
Illinois State University
College of Education
Locarte@ilstu.edu

Abstract: It is important to know more about the potential contributions and needs of SITE participants in order to inform further developments of the society and the field. During the SITE 2001 conference 165 participants completed a survey and 38 personal interviews were conducted, with equity at the top of the list of keywords. Analysis shows that SITE participants have concerns, which include collaboration and organizational development and can contribute extensive expertise and resources to our society and teacher education. SITE is acting on this information with online forums, committee work, and a digital scholarship portal in collaboration with CILT and the TEN PT3 Project. The survey will be repeated at SITE 2002.

The Society for Information Technology in Teacher Education (SITE) is an international organization that seeks to encourage appropriate uses of information technologies in teacher education worldwide. In an effort to build a shared community of resources, a coordinated project was undertaken to establish a new collaboration between the memberships of SITE and the Center for Innovative Learning Technologies (CILT) with support from the US initiative preparing tomorrow's teachers to use technology (PT3). CILT is a distributed research center that excels in fostering community and gathering innovative research in technology for learning and instruction. It is expected that this collaboration will allow both groups to help reinforce each other's work and philosophy, with an ultimate goal of informing policy development and the reformation of teacher education and the use of IT.

Borrowing strategies from the field of Knowledge Management, ASTUTE aims to help these organizations "renew" themselves, while making fuller use of their existing resources. Knowledge Management has been defined as:

a conscious strategy of getting the right knowledge to the right people at the right time and helping people share and put information into action in ways that strive to improve organizational performance. (O'Dell, Grayson, & Essaides, 1998.)

To meet ASTUTE's multiple goals, a needs analysis of SITE participants was conducted at the 2001 annual conference in Orlando, FL, USA. An online survey, which incorporated participant wants and needs, was administered to conference attendees. 165 individuals completed this Web-based survey. Additionally, 38 personal interviews were conducted, and a special interactive session was held at that SITE conference. The session focused on core issues for technology in teacher education, while ensuring that equity remains an integral aspect. The session introduced CILT, PT3 Teacher Education Network (TEN), and ASTUTE to the SITE community. The 2002 conference session will present survey data and debate planned developments.

An analysis of the online survey and the personal interviews revealed significant information about how members would like to participate in the IT community. Perhaps the most important was an over-arching desire of SITE

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members to be more involved in the organization, particularly in the area of sharing skills and resources with their colleagues. This was evidenced in both the self-identified needs and contributions of the surveyed membership. While many of the identified contributions and needs are vague, several are highly focused and show the depth of the expertise and desire to assist colleagues. A sample of the contributions SITE members believe they can offer the organization, expose the wide range of skills, abilities, and expertise. Two typical examples were:

- I can provide to SITE members mentoring in the use and infusion of technology into pre-service communities, especially diverse populations.
- I can provide SITE members dialogue and reflection on teacher leadership roles, application of quantum mechanics to field of education.

Among the most powerful contributions that members have to offer each other are online repositories and resources. These include virtual libraries, discussion and message boards, directories, and tutorials. These are being collected and will be offered to all members and the wider community.

Perhaps of greater interest are the self-identified needs. Many of these needs reflect a desire to be more involved in both the SITE organization and the profession as a whole. One member, who is attempting to develop a virtual library of resources for preservice teachers and teacher educators, identified this type of need: "SITE members can assist me by/with identifying the kinds of instructional, research and professional development contents they would most like to see made available to them via a virtual library." While the need is specific and identifies a request for information and assistance, it also reflects a desire to be more involved in, and to make a contribution to the profession as a whole.

At the same time, it appears that there is a belief among the SITE participants that the organization may not be as open and accepting of alternative perspectives and philosophies as it could be. One respondent stated: "SITE members can assist me by providing scholarly information and research from a variety of sources including some that may be different from the norm. Be open and more inclusive." Another member was even more specific in identifying this belief, not only as it affects the organization, but also the effect that our practices may be having on education at large: "SITE members can assist me by being more open to heavy critique of some approaches to education technology implementation and to be more willing to openly reflect on how their own practices may be contributing to the inequities illustrated by the digital divide research, because looking at this from a wider perspective, the people who have always been disenfranchised by the education system (in the US particularly) are the same folks who are being further disenfranchised by the digital divide."

Other members identified a desire for the organization to become more diverse and open in its leadership roles: "SITE members can assist me by encouraging leadership roles in its membership in a variety of forums providing a central community area with active discussions on topics as wide ranging and diverse as its membership."

Similar opinions and trends emerged from the personal interviews. One interesting trend that did emerge from these interviews is a desire to use the technology to create a shared community of skills, abilities, knowledge and interests. One individual felt that one way in which SITE could help is by providing a clearinghouse for others developing virtual expertise to be used in the classroom. They would like to see a greater practical sharing of what the technology can and cannot do. One member even went so far as to comment that they would like the opportunity to talk with others in the same predicament. A different member suggested that they would like to see the creation of a resource that would provide online access to experts and exemplary materials.

Other members felt that there is still more room for organizational collaboration. In addition to the current collaboration between SITE, CILT and TEN (in the form of this ASTUTE project), those interviewed suggested that there needs to be greater collaboration with such organizations as AECT, and AERA, as well as collaboration between the SITE journal, The Journal of Technology and Teacher Education, and T.H.E. Journal.

The first of the predetermined key words available for surveys and interviewees to assign to their responses was "equity." This was done to encourage participants to address issues of equity in their responses and promote inquiry into equity issues in IT. In addition to the points noted above many respondents seemed to be concerned about the

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lack of equity pedagogy in IT and as a result of their observations wanted to contribute their expertise and experience to help promote more equity-conscious practices in IT.

When asked what excites them most, the majority of participants appear to be most excited by learning. They report that they enjoy watching preservice teachers grow and learn to become not only good teachers, but to share in the excitement and love of learning. One person said that they are "looking for teachers where teaching comes first, but they are willing to take a risk to make an impact with IT."

It is expected that, as it grows, the ASTUTE project will inform actions to help fulfill many of these needs, as well as to provide an outlet for the varied contributions members wish to make. SITE, through its president, is employing techniques informed by Havelock & Zlotolow (1995) which were introduced by Niki Davis (2001) in her keynote speech at the SITE 2001 conference and developed discussed within the Preface to these proceedings (Davis, 2002). General themes and specific requests will also be passed on to the committees where appropriate. A number of web-based developments also provide potential activities:

- The TEN's project's clearinghouse, which includes a virtual library and personal learning portal (<http://www.teacherednet.org>)
- The Digital Scholarship Portal (Bull, Sprague & Bell, 2001)
- The SITE and AACE online forums and career center (<http://www.aace.org/site/forum>)

A revised survey and panel session will take place at the 2002 SITE annual conference in Nashville, Tennessee, USA. The end result should be organizations that are more responsive to and reflective of their general memberships.

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Leading Change in Utah Schools with Technology: The T-PLUS Project

Dan Eastmond
Director of Learning Resources
Western Governors University
deastmond@wgu.edu

Marti Garlett
Dean of Teachers College
Western Governors University
mgarlett@wgu.edu

Abstract: Western Governors University (WGU), through grant funding from the Bill and Melinda Gates Foundation and the State of Utah, has developed the Technology for Principals Leading Utah Schools (T-PLUS) Project. This innovative distance program provides competency-based in-service education that enables Utah principals and superintendents to take leadership in technological change for instruction in their schools and districts. A collaborative venture, WGU is working with other universities within Utah and Arizona to provide online distance courses with embedded assessments, as well as a supervised action research project. Successful participants earn a graduate certificate in Technology Leadership. This paper presents the design of the T-PLUS initiative, its goals and collaborative delivery through the Web to administrators throughout Utah, and the results to be realized by the project.

Overview

T-PLUS is an intense, technology-rich, leadership-driven professional development program for Utah principals and superintendents. Participants who complete the program receive the Advanced Certificate in Technology Leadership from Western Governors University and earn 144 relicensure points along with eight (8) semester units of graduate credit from the Utah State Office of Education. The \$2,000,000 grant allows for 70 percent, or about 670 members of Utah's 949 public and private district and school leaders, to participate in this professional development opportunity. The program is funded for three years and includes the following:

- A WGU faculty mentor assigned to provide personalized assistance and coaching to each participant, as well as guidance in assessing the knowledge and skills each participant already has when she or he comes to the program.
- Learning resources, including coursework, that help participants gain new competencies.
- Access to six distance-delivered group gatherings for connection with other participants via EDNET, the Utah Education Network's interactive teleconferencing system.

The T-PLUS curriculum is designed with a close eye on the evolving work of the International Society for Technology in Education's Collaborative for Technology Standards for School Administrators (TSSA Collaborative) and its March 2, 2001, release of proposed standards for (1) superintendency and cabinet-level leaders, (2) building-level leaders, and (3) district-level leaders for curriculum and special programs. The program also matches to the Milken Seven Dimensions and utilizes the best practices of adult learning.

The learning opportunities consist of multiple elements, including support in the form of online resources and discussion groups. T-PLUS also includes six major satellite institutes delivered throughout the State that are designed to orient, energize, and celebrate the program's completion through the awarding

of a professional development certificate (WGU's Advanced Certificate in Technology Leadership) and sharing the outcomes of participants' action research projects. This combination of competency-based and distance or distributed education makes WGU a compelling and convenient choice for busy administrators to pursue advanced study in technology integration and implementation leadership. It should be noted that for administrators new to the world of technology-assisted teaching and learning, opportunities for basic skills tutelage and practice are provided through the regional service centers and other Utah state resources.

T-PLUS Goals

The overarching purpose of the T-PLUS project is to support Utah's K-12 technology goals through a well-defined, state-coordinated technology leadership initiative that, via professional development opportunities, promotes integration of technology in district- and school-wide teaching and learning and focuses on increased student achievement.

Specifically, T-PLUS is designed around four primary goals:

- *GOAL I:* Identify and critique technology-supported learning environments that address instructional or performance improvement goals.
- *GOAL II:* Oversee and manage a technology-integration project team and its process, including providing for relationships among all stakeholders.
- *GOAL III:* Develop and justify strategies and tactics for introducing and integrating new technology tools and techniques based on change theory or a change model.
- *GOAL IV:* Design and complete an action research project either individually or collaboratively with one or more other participants. The project will be field-based, data-driven, and reflective of outcomes based on a technological intervention.

Program Delivery:

The heart of the T-PLUS leadership initiative is to provide all Utah superintendents and principals an opportunity to gain competency in two domains of knowledge: Technology Implementation and Leadership with Technology. Each participant's demonstrated mastery of the competencies included in these two domains will result in the awarding of a professional development certificate entitled "The Advanced Certificate in Technology Leadership" from Western Governors University.

In addition, demonstrated ability to apply the competencies will be realized through an action research project that participants may do individually in their own school setting or collaboratively with other schools in their district or geographic proximity. This action research project is designed to accomplish two goals of its own: (1) Help participants synthesize their learning, and (2) Provide a context for ongoing growth and development in technology leadership throughout the State of Utah and beyond the life of the T-PLUS project.

The program design *contains* three basic elements:

1. Six synchronous, distance-delivered, whole-state gatherings.
2. Establishing and carrying out a professional development action plan for each program participant to demonstrate the 12 required competencies.
3. An action research project that synthesizes the competencies and provides a practical application of those competencies and that allows for expansion of the project beyond the grant's three-year life.

The design organizes building principals into regional cohort groups by Educational Service Units. The participating superintendents will comprise a cohort group of their own, wherever they are geographically situated.

T-PLUS Institutes

Six synchronous two-way interactive audio-video institutes are being delivered via the EDNET system which is developed and maintained by the Utah Education Network. The content will include a number of things, such as addressing a current issue in educational technology via an expert on the topic, a review of standards such as the Technology Standards for School Administrators (TSSA) recently set by the International Society for Technology in Education (ISTE), program information and support, and information about the types of action research projects that are occurring throughout the state. Importantly, these events also provide an opportunity to interact with participants statewide and build synergy and teamwork for ongoing district- and school-based technology projects beyond the life of the TPLUS initiative.

These six institutes are being held at various EDNET locations throughout the state in November 2001, March and November of 2002, March and November of 2003, and March of 2004. Each program participant is required to attend at least two of these six synchronous events.

Mentoring and Courses Delivery

Mentors take the place of traditional instructors at WGU. A mentor is assigned to each student upon admission and, with rare exceptions, remains with that student until he or she completes the targeted program of study. The mentor develops collaboratively with each student the individual "Academic Action Plan" that will serve as that student's road map to completion. It takes account of the student's background, strengths and areas still needing growth, interests and goals; it identifies areas where the student may be ready or nearly ready to sit for performance assessments, as well as other areas where new learning will need to occur before attempting an assessment; it identifies courses and other learning resources the student will need for development of the necessary expertise; and it establishes timelines for accomplishing goals. The mentor helps students enroll in the courses they will take, introduces the student to WGU's online library resources, and lines up accessory readings that the student can use. The mentor answers questions, serves as coach, intermediary, and ombudsperson.

Upon completion of the online application, a TPLUS mentor will contact each participant individually. She or he will ensure that each participant fully understands how the program works. Prior to beginning the certificate, participants will complete a skill survey, a WGU pre-assessment, and the (Taking a Good Look at Instructional Technology) TAGLIT survey. The skill survey and pre-assessment assist the student and mentor in identifying strengths and weaknesses as aligned with the TPLUS goals and objectives. While the TAGLIT survey will inform this process as well, it will also provide the mentor and the program participant a focus for the action research project. These T-PLUS mentors will then continue to work with each participant on an ongoing basis throughout the program until its completion.

There are two options for participants. Based on pre-assessment findings, they can go directly to final assessments and take no coursework (a time effective way of demonstrating prior learning), or they can take three specified online courses through Utah and Arizona institutions of higher education that have created courseware specifically written to the T-PLUS goals and objectives. They can also do a hybrid of the above, that is, take final assessments for some of the competencies while completing the remaining competencies via instructor-led courses. Although going directly to the final assessments can be chosen as a "test-out" option for areas of the program a participant already fully understands and is competent in, the action research project will be completed by all participants either independently or in collaboration with other participants, no matter which of the above paths is taken. One of the three course options is an action research course that embeds the final project within it. The mentor assigned to a program participant, in coordination with the participant, will set up an individualized completion plan that can be tweaked as necessary during the participant's progression through the program's requirements.

Since WGU does not offer courses itself, it contracted with other universities in Utah and Arizona for the three graduate courses that support the certificate. Course development took place during fall semester 2001 so that delivery could begin in January 2002. Development entailed customizing the content of a similar course at the hosting institution to the goals and objectives outlined above and/or converting it to a format deliverable via the Web. The objective assessments for this content, consisting of multiple-choice and essay test items, were further refined by WGU from assessments used in its Master of Arts in Learning and Technology degree program. These assessments were integrated into the courses as final examinations. The courses are being delivered via the Web for six to eight semesters (spring, summer, and fall) for two and a half years. The assessments are scheduled by WGU each semester at a proctored site convenient to each student.

Program Evaluation

All programs at Western Governors University, including the Advanced Certificate in Technology Leadership, are based on the successful demonstration of competencies. Competency assessments provide a valid, reliable, and quantifiable evaluation of the degree to which the learning goals and objectives are met. In addition, WGU is evaluating program effectiveness through a series of qualitative measures. These will include surveys of participant experiences through various components of the program, such as satisfaction with WGU mentors and satisfaction with the courses and other learning opportunities provided, as well as qualitative evaluation of participant experiences in the synchronous T-PLUS institutes. In addition, participants complete the TAGLIT survey at the beginning and end of the T-PLUS program, a rich source of information for a pre- and post-comparison of whole-school improvement whose results are influenced, though not controlled, by the T-PLUS program design.

Multiple measures of knowledge, skills, and abilities not only assure that program participants have mastered the content of the certificate, but also provide rich data to evaluate the overall effectiveness of the program. The evaluation allows comparison of participant experiences against a number of demographic (i.e., age, gender, rural/urban location) and educational variables (i.e., courses taken, independent learning resources used, grade points earned). All program participants will also be asked to participate in an end of program satisfaction survey. This survey measures not only student satisfaction with program services, but includes also the relevance of competencies to their current and future positions. The assessments and evaluations of this program are being overseen by the WGU Assessment Council, comprised of nine national and international experts in assessing student learning.

Conclusion

The professional development that Utah principals and superintendents are undertaking through this initiative will allow them to demonstrate their ability to lead the technology change process in Utah Schools. The T-PLUS Project makes it possible for these educators to encourage and inspire sound pedagogy in K-12 environments via technology, providing them access to this exceptional educational experience through online courses, mentor guidance, and the opportunity to demonstrate their knowledge and skills through competency assessments.

Technology Leadership: Shaping Administrators' Knowledge and Skills Through an Online Professional Development Course

Peggy A. Ertmer
Department of Curriculum and Instruction
Purdue University
United States
pertmer@purdue.edu

Hua Bai
Chaoyan Dong
Mohammed Khalil
Sung Hee Park
Ling Wang
Department of Curriculum and Instruction
Purdue University
United States

Abstract: This research examined changes in administrators' ideas about technology integration and technology leadership while participating in an online professional development course. Eight administrators, enrolled in a semester-long course, participated in 15 discussion forums related to k-12 technology implementation issues. Pre- and post-course surveys indicated significant changes in ideas about technology integration as well as methods used to support teachers' integration efforts. Analysis of interview and course discussion data suggests that administrators view technology leadership as a "shared responsibility" that requires both administrative skills and technical knowledge.

Theoretical Framework

According to the SouthEast Initiatives Regional Technology in Education Consortium (SEIR*TEC, 2000) "leadership is the single most important factor" influencing the successful integration of technology within our schools. Based on their extensive work in k-12 schools, SEIR*TEC noted that the schools that have made the most progress toward technology integration are those with energetic and committed leaders. Stegall (1998) reported that this influence held true despite wide differences in schools' enrollments, locations, and operating budgets.

Few educators today would argue with the notion that the principal plays an important role in facilitating technology use in the schools. According to Crystal (2001), building administrators are the "nexus through which all issues flow" (p. 36). Yet many of our administrators are novice technology-users and have gained little experience or training in the knowledge and skills needed to be effective technology leaders. Even though administrators *understand* the importance of implementing and supporting technology use in their schools (Mehlinger & Powers, 2002), the development of technology leadership skills seems to have been left almost completely to chance. Since it is possible to obtain a principal's license without knowing anything about technology, how, then, are our administrators expected to develop these critical skills?

Unfortunately, there is very little research delineating best practices for preparing administrators to be technology leaders. Most school administrators are simply acquiring their technology knowledge and skills on the job, with occasional training provided by assorted vendors, professional organizations, and, to a lesser extent, colleges and universities. According to Mehlinger and Powers (2002), "Graduate school programs generally are doing a poor job in preparing school principals and superintendents to be technology leaders" (p. 218).

Still, colleges of education have started to consider ways to address technology needs within their school administration programs (O'Neill, 1999). Furthermore, a national collaborative has recently drafted a set of technology standards for school administrators (TSSA, 2001) that can guide the redesign and/or development of new graduate

courses. Given the number of issues that need to be addressed, however, innovative approaches will be needed if administrators are to gain the pedagogical, as well as the technical, knowledge and skills needed.

Purpose of the Study

This study was designed to examine changes in administrators' knowledge and skills, related to technology leadership, as they participated in a semester-long online professional development course. By requiring administrators to use technology to examine issues of technology leadership, we hoped to support the development of administrators' ideas related to technology leadership, while simultaneously building their confidence and competence related to technology skills. Specifically, the questions guiding data collection and analysis included:

- What are administrators' ideas about technology leadership and how do these ideas change while participating in an online professional development course?
- What knowledge and skills do administrators need to affect technology leadership in their schools and to what extent can participation in an online professional development course build both knowledge and skills?

Methods

We gathered both quantitative and qualitative data to examine changes in the knowledge and skills of eight administrators enrolled in a 3-credit course, *Integration and Management of Computers in Education*, during the fall semester of 2001. This course was one of two courses that participants were required to take during their first semester in the university's cohort doctoral program in school administration. Although cohort students had been required to take this course in the past, this was the first time the course was offered completely online. Furthermore, this was the first time the course enrolled only administrators; previous offerings of the course included a mix of administrators, undergraduate pre-service teachers, graduate in-service teachers, and graduate students in educational technology. Having a homogenous audience in the course allowed for a more extensive focus on administrative leadership issues than had been possible previously.

All 8 administrators agreed to participate in the study. Participants included 2 females; 4 participants were assistant principals, 3 were principals, and one was a district-wide instructional technology coordinator. Teaching experience ranged from 3 to 18 years, with an average of 7 years, while administrative experience ranged from 2 to 8 years, with an average of 4 years. At the beginning of the course, participants had varied levels of technology skills. Although most ($n = 6$) indicated that they used e-mail "as an integral part of their lives," only 4 indicated previous experiences with bulletin boards or chat rooms. In general, participants described their uses of technology as being limited to "word processing and surfing the Web." None of the participants had previously taken an online course ("WebCT is completely new to me, as well as chat rooms and message boards."). Participants expressed some initial uncertainty about learning via an online approach ("At this point, I am still uncomfortable using this type of technology to communicate.").

The 3-credit course (<http://tct.soe.purdue.edu/tipdoc>) was designed to help administrators gain both the competence and confidence needed to facilitate and support effective learning environments supported by technology. Participation in the course comprised a variety of virtual interactions and discussions and incorporated three primary strategies (modeling, reflecting, and collaborating) that, based on previous research, were judged to be effective in supporting teacher and school change. For example, participants observed (via the Web and CD-ROM) a number of model teachers, engaged in ongoing reflective conversations, and collaborated with each other for the completion of various course activities. As a cumulating activity, each participant created a WebQuest that they planned to implement with their building teachers during the spring, 2002.

Data Collection and Analysis

Participants completed three online surveys at the beginning of the semester. These related to 1) previous experiences with technology applications, 2) specific ideas about technology integration, and 3) current technology practices within their schools. The first survey (15 questions) gathered information about participants' current positions, previous uses of computers, and comfort with specific technology applications (e.g., chatrooms, discussion boards). The

second survey (10 items) examined administrators' perceptions of how well they could conceptualize and define various components of technology integration. Survey items were presented in a Likert-style format; participants rated their level of agreement (from 1-strongly disagree to 5-strongly agree) with statements related to the possession of specific ideas regarding technology use (e.g., "I have specific ideas about how to define teacher/student roles in a technology integrated classroom."). The third survey, comprised of 44 items, examined the technology practices of both the administrators and teachers within the participants' school environments. Although this survey provided important information about the contexts in which our participants worked, not all items were relevant to our research questions. However, 13 items, representing two subscales, were particularly relevant. One subscale (6 items) examined administrators' personal uses of technology (e.g., "I use technology to support lectures and/or professional development.") while the other subscale (7 items) asked the administrators to rate the extent to which they supported teachers' efforts to use technology (e.g., "I give individual feedback to teachers during technology use."). On a scale from 1 (entry) to 4 (proficient), administrators rated their current levels of competence. The second and third surveys were completed again at the end of the semester in order to measure changes in administrators' ideas about, and strategies for providing, technology leadership in their schools.

In addition to survey data, all assignments (included the completed WebQuests) and discussion board postings (917 total messages) were used as data. Weekly discussions included, among other topics, administrators' reflections on their current visions for technology use in their schools; roles they play in supporting high-, medium-, and low-level technology users; strategies for supporting teachers' early efforts; incentives and barriers to technology use, and so on. Weekly electronic chat sessions, focusing on issues of technology leadership, were also recorded for analysis purposes. During the 12th week of the semester, during a scheduled campus meeting for their other cohort course, all administrators participated in an in-depth interview that was tape-recorded and later transcribed. Questions built on earlier survey responses; we examined participants' current ideas about technology leadership and probed for any changes that may have occurred during the course (e.g., "What does it mean to you to be a technology leader in your school? How have your ideas about technology leadership changed since the beginning of the course?").

Data analysis began during the first week of the course and continued throughout the semester. Both quantitative (descriptive statistics and paired t-tests) and qualitative (pattern seeking) analysis methods were used to determine the extent to which the online course offered a viable method for increasing administrators' understanding of, and capacity for, technology leadership.

Results and Discussion

Perceptions of Technology Leadership

Participants were asked to define technology leadership and to describe the skills and knowledge needed by a technology leader. In general, administrators defined technology leadership as the methods they, and others, use to encourage and support teachers' technology use. Strategies such as visioning, modeling, and coaching were considered key to being an effective leader. Although 7 of the 8 administrators believed that they, themselves, played this role in their schools, most participants noted that they shared this role with others—either their technology-using teachers, the technology coordinator, or some other person in the school. As one elementary principal noted:

I would not say I was the leader. I am more of a cheerleader. I view my role as a role model but also as a cheerleader who focuses teachers on what is the best. I have the opinion that I should not be the smartest person in the building, that it should be the teachers who are the best resources. And that, thankfully, in my school, certainly is the case.

Carr (1995) refers to this style of leadership as participatory, suggesting that power and control are shared, at least to some degree, among constituents. This participatory style was commonly discussed, and agreed upon, by the administrators in this course. Although they believed that the effort should be *started* and *supported* by them, they felt that others shared responsibility for seeing it through:

I think it's ultimately my role ... but then we're all in this together. It's a building effort; it's something we all need to take responsibility for.

Although many of the administrators did not think that their ideas about *leadership* had changed during the

semester, they noted that they had gained many ideas about technology integration as well as how to support teachers' efforts. One middle school principal described this change (posted on the discussion board):

When I entered the class I was unclear about the proper integration of technology. I would encourage teachers to use the Internet, drill and skill software, and word processing. Other than that I did not have a good handle on the many possibilities. Since then I have really begun to better understand the use of technology in the classroom through WebQuests, research projects, presentations, etc. The second idea has been the techniques and confidence to lead staff as a technology leader in the building. It is something that I had not very concerned about prior to this class.

Perceptions of Knowledge and Skills Needed by Technology Leaders

When asked what knowledge and skills they needed to be effective technology leaders, participants mentioned the need to be models for their teachers, but were unsure if they needed to know *more* than their teachers in order to be effective. One principal suggested that a good technology leader identifies the exemplary users in his school and then "gets out of their way." However, an assistant principal disagreed, "I don't think I am going to be an effective leader ... if I am not using it myself." Another principal suggested that he "had to believe in it, had to use it, and had to model it." Certainly, the administrators agreed that they needed to have enough knowledge to hire the right people, to acquire the best resources, and most importantly, to know what good technology integration looked like so that they could encourage their teachers to continue to grow. According to one assistant principal, "these skills are just good leadership skills, not necessarily technology knowledge skills. These are people skills, management skills."

Administrators agreed that an online course, focused on technology integration and technology leadership, filled an important need for practicing administrators. By requiring them to "live and breathe technology" they increased their own skill levels as well as their expectations for their teachers. They believed that by developing a strong personal vision of technology integration they could, in turn, support the development of their teachers' visions.

Developing the Skills and Knowledge of a Technology Leader via an Online Course

Strudler and Wetzel (1999) stated, "At the core of informed leadership is a person who has internalized the complexity of effective technology integration and who exercises influence to ensure that the various enabling factors are in place" (p. 68). This suggests that technology leadership requires two sets of competencies: 1) understanding technology integration and 2) providing the necessary support to ensure that effective integration can occur. These competencies relate specifically to the knowledge and skills needed by technology-leading administrators. In order to determine the impact that this online professional development course had on the development of administrators' technology leadership knowledge and skills, pre- and post-course survey results were compared.

A two-tailed paired t-test ($df = 7$) indicated a significant increase in administrators' ratings of perceived ideas about technology integration (survey 2) from pre- to post-course ($t = 3.81$, $p = .007$). Average ratings increased from 3.7 (undecided-agree) to 4.0 (agree). This suggests that, as the course progressed, administrators gained ideas about what technology integration should look like, as well as how technology might be implemented within various classroom contexts (e.g., one-computer classroom; in support of content-learning). Given that administrators play a key role in establishing a technology vision for their schools, as well as evaluating teachers' efforts toward achieving that vision, it is critical that they gain specific ideas about effective technology use. These ideas, then, represent an important prerequisite to being able to both lead and support teachers' efforts.

Although no significant differences were noted from pre- to post-course ($t = 1.19$, $p = .14$) on the first subscale of survey 3 (administrators' personal uses of technology), average ratings of competency on the second subscale (administrators' support of teachers' technology use) increased from 2.0 (emergent) to 2.4 (emergent-fluent). This increase was significant ($t = 2.82$; $p = .01$). Thus, as the administrators participated in weekly discussions, focused extensively on technology support issues, they were able to identify and implement new ways to support technology use among their teachers. As one principal noted:

Taking this course has brought technology to the forefront for me ... it's something that I discuss more with teachers ... I have started conversations with them about what they can do to help bring more technology into their classrooms. I ask them what are some of the things they need in order to accomplish the things they are

thinking about. This course has helped me to go out of my comfort zone and to do a paradigm shift in my thinking on instructional practices in the classroom.

Ongoing discussions with the administrators suggest that this approach to professional development may be an effective way to increase confidence for, and ideas about, technology leadership. Administrators agreed that the course increased their understanding of how to support technology use among their teachers, as noted by the following comment:

(When I was a teacher) I did not have any training on how to effectively integrate technology in my classroom. Actually this is the first course that I have had that teaches how to integrate technology. Too bad I am not a teacher anymore. At least after having taken this class I will have an idea of how to assist someone in integrating technology.

Educational Significance And Implications

Participation in an online course, focused on technology integration and leadership issues, appears to offer one means for helping administrators understand the complexity of the integration process and to find new ways to support their teachers' integration efforts. By requiring administrators to deal with technology issues as part of their ongoing course participation allows them to experience, first-hand, both the benefits and challenges of dealing with technology in a meaningful and substantive way.

According to Mehlinger and Powers (2001), "It is no longer possible for administrators to be both naive about technology and be good school leaders" (p. 218). Yet, to date, the professional development needs of the administrator, as a technology leader, have been virtually ignored. Despite the large amount of time, money, and resources being directed toward supporting *teachers'* efforts to integrate technology in the classroom, little has been done to either recognize or support the needs of the administrator. "Clearly, it is not reasonable to imagine that teachers, the "followers," are going to get very far ahead of the "leaders," their administrators" (Mehlinger & Powers, p. 213). The results of this study highlights the importance of the administrator in helping schools achieve sound technology practices, and proposes one strategy (participation in an online course) for increasing administrators' capacity for technology leadership.

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PT³ AND T³L – Teaching Tomorrow's Technology Leaders: Preparing School Leaders to Use Technology

Ian W. Gibson

Department of Administration, Counseling, Educational, and School Psychology
Wichita State University, Kansas, United States

ian.gibson@wichita.edu

Abstract: This paper describes the symbiotic relationship between school district and university personnel as they collaborate in the technology preparation of school leaders enrolled in programs of graduate study at Wichita State University. By learning to do research as they conduct research for local school districts, graduate students in these programs become skilled in research methodologies and expert in the topic of the research focus. In the example presented in this paper, graduate students conduct a full district evaluation of current information technology practices, needs, and expectations in preparation for the writing of a report designed to assist in the development of the next stage in the school district technology plan. Such a data based approach to the development of educational technology futures provides an information technology decision making platform for the target school district as well as providing a solid grounding for the future technology actions of these neophyte researchers when they assume the mantle of leadership in their own school districts. The paper describes the methodologies used, the results of the research, and the impact of the process and the findings on both the target school district and the graduate student / future school leader.

Introduction

Significant attention continues to be paid to the technology development of tomorrow's teachers and their ability to use educational and information technologies effectively in their professional practice (see U.S Department of Education, 2001, <<http://www.pt3.org/>>). The tendency to devote unparalleled amounts of federal, state, and local educational dollars to the technology preparation of teachers is on-going and is rarely questioned in school contexts. There is an increasing realization however, that teachers, well prepared in their use of technology, are not as effective in their technology integration efforts unless there are well prepared school leaders capable of motivating, collaborating, and supporting these technology integration efforts (Gibson, 2001; Mahmood & Hirt, 1992; Maurer & Davidson, 1998; McPherson, 1995; OTA, 1989, 1995; Rodin, 1997).

Recent action on a national level has attempted to redress this oversight through the development of a set of technology standards for school administrators (see Technology Standards For School Administrators (TSSA) Collaborative, 2001, <<http://cnets.iste.org/tssa/>>). Other efforts to prepare school leaders in the use of technology on a local scale are also in evidence (Gibson, 2000). Recognition of the need for continued expansion of efforts to focus attention on the technology preparation of tomorrow's school leaders is growing. This paper explores one approach designed to contribute to this movement.

The activities described in this paper focus on the collaborative efforts of school district personnel and faculty and students from a local university in a mid-western region of the United States. In this on-going project, graduate students enrolled in the doctoral program in Educational Administration and Supervision at Wichita State University in Kansas participate in a research and field based program of collaborative study designed to support the school improvement efforts of local school districts. Graduate students and professors conduct high quality research projects for participating school districts framed around local issues of relevance or need. Many of these collaborative research projects focus on technology issues.

The research described in this paper considers the symbiotic interaction of school leaders / graduate students learning to conduct research on technology issues for a client district at the same time as acquiring research skills and technology related knowledge and understanding that will benefit their own schools and districts. Further, the heavy emphasis upon a constructivist approach to teaching and the integration of information technology as a transformational element in this approach to graduate education provides a fully rounded, authentic, contextualized, and effective example of preparing tomorrow's school leaders for their central role in the integration of information technology into learning environments.

Graduate Preparation of School Leaders

In a previous paper on the topic of graduate preparation for school leaders, Gibson (2000) described the leader preparation program at Wichita State University in Kansas as a reflective and informed response to calls for reform in educational administration. This doctoral program was predicated upon the belief that a collaborative, situated, problem-based approach to instruction about leadership would generate an authentic approach to the study, replicating as closely as possible the working environment most common to school leadership in highly effective schools. Program activities focus around authentic problems of practice, explored in collaborative team settings, and generating learner-directed and setting-enhanced learning. It is believed that within these problem situations the important concepts and principles associated with the content domain are analyzed and explored and are perceived by graduate students as real problems of practice (Savery and Duffy, 1995). Within this environment, technology integration is modeled by faculty (Blomeyer & Clemente, 1997), and meta-cognitive scaffolding is provided by faculty and peers (Savery & Duffy, 1995). The core tenets of constructivism, including the ideas of cognitive dissonance and negotiation of meaning (Savery & Duffy, 1995), are integral components of this program. In addition to

preparing effective leaders for schools, this program was also designed to emphasize the transformational role of technology on the process of learning.

The approach adopted for the graduate program in educational administration at Wichita State University requires the acquisition of high levels of expertise with selected program technologies designed to provide efficient and customized personal and professional productivity. In this program, students are dependant upon a foundation of technology expertise as they assume the role of participant, collaborator, colleague, leader, and follower, in a variety of learning environments such as seminar, field study, content presentation, data manipulation, research reporting, group/individual comprehensive examinations, and the dissertation. Program graduates acquire, among other things, an understanding of the impact of information technology on their roles as visionary leaders of schools of the future and experience the transformational potential of technology on their own learning process (Gibson, 2000).

Featured in a recent issue of the *Journal of Critical Inquiry into Curriculum and Instruction* (Vol. 2, No. 1), which publishes exemplary research products of graduate students in professional study, this program has attained both national and international exposure resulting from its unique combination of clinically oriented, field-based, applied inquiry features. The program has separated itself from traditional leader preparation programs through an emphasis upon (a) rigorous admission requirements and low enrolment, (b) release time from district employment for prospective students, (c) integration and contextualization of the curriculum, (d) incorporation of field-based research studies, (e) a collaborative, team-based approach to teaching and faculty load distribution, and (f) a cohort-based student support structure.

The remainder of this paper focuses upon one aspect of this program of graduate education in educational administration, specifically, a description of the process and product of that component of the theoretical framework of the program derived from the field of problem-based learning (PBL) (Boud, 1985; Boud and Feletti, 1991; Bridges, 1992). In this example, the focal points of field- and problem-based program processes and the recurring focus on technology come together in one significant program event extending across a full semester of collaborative field research.

Collaborative Learning, Field Research, and Professional Partnerships

In this graduate program, each semester begins with doctoral field study teams exploring potential research areas with school boards and administrative personnel from local school districts in an attempt to isolate an issue worthy of a full semester of research. Following this introductory discussion, a formal research proposal, complete with rationale, beginning literature review, methodology etc. is developed and presented to the 'client' school district for approval. Once approved, the process of exploring the topic more fully begins with each field study team, comprising students and professors, developing foundational understanding, potential research designs, research tasks, processes, data collection tools, protocols, and analysis procedures. Contextualizing the learning and the instruction in authentic problem situations, integrating the supporting curriculum, providing scaffolding though the provision of mentoring roles derived from the cohort construction of the program, and emphasizing the orientation towards constructivist learning approaches allows a natural interplay between theory, research, and practical applications to occur during involvement in the analysis of innovative projects or problem situations in the field. It is this involvement in field study applications, with meaningful participation in internet searches, literature review, field reports, data analysis, report generation, research presentations, file sharing, information retrieval, collaborative study, and sharing of research resources that allows the technology component of this program to be integrated, authentic, and meaningful. In the example that follows, the field study topic selected by the client district focused upon the issues and practical aspects related to the planning, administration, and management of technological innovation and change in the form of the next stage in an already established district wide technology plan. The site for this study was a high performing, small rural school district proud of student achievement scores, and proud of the existing level of 'integration of technology' into the educational process.

Field Study Methodology

During an introductory discussion with district leaders designed to establish the general area of concern for the research, the following statements set the scene for the field study: "How do I help my teachers effectively implement the use of technology in the classroom?", "We're asking teachers to change the way they teach", "Guide us to a new spot", "Veteran staff might make implementation difficult", "We would start a process that will go on", "Teachers are going to be asked to re-think how they deliver instruction", "Most of the kids are going to be way ahead of the staff", "This is a very competitive district - they want to be perceived to be ahead of everyone else", "What kind of activities can we involve teachers in that will improve their skills and usage", "Focus on the pedagogical use of technology in the classroom."

Following this lengthy discussion with teachers, technology coordinators, administrators and board members of the district, it was determined that the need for additional guidance on the next step of the district plan for effectively integrating technology as a tool in the instructional environment was necessary. A decision was made to make those issues related to curriculum and instruction the focal point of the study. The purpose of the study was therefore to provide guidance to the district regarding strategies related to effective integration of technology into the instructional environment. The study team developed three research questions as a guide for the study:

1. What does district data convey about the status of technology use within the instructional environment?
2. What are students', teachers', and administrators' perceptions regarding the technology needs within the instructional environment of the district?
3. What would improve the integration of technology within the instructional environment of the district?

The study team chose a qualitative paradigm for the study's design. This design allowed the team to obtain rich, descriptive data from students, teachers, administrators, and technology coordinators. These data provided a thorough description and understanding of the

technology usage in the district at the time of the study. The documents reviewed by the study team provided further data relative to district technology use.

The research design allowed the study team to triangulate data from various sources to determine findings. Patton (1990) stated, "A multi-method, triangulation approach to fieldwork increases both the validity and reliability of evaluation data" (p. 245). Triangulation of various data collection techniques permitted the team to combine the strengths and correct the weaknesses of any one source of data. In using triangulation as a method of data analysis, "the researcher seeks out several different types of sources that can provide insights about the same events or relationships" (Patton, p. 115).

The study team used multiple research methods to explore the three research questions. The research methods included focus groups with students and faculty, interviews with administrators and technology coordinators, and an analysis of district documents. The combined data were subjected to a process of constant comparative analysis (Lincoln & Guba, 1985) and resulted in the findings presented below. Following further analysis, conclusions were derived from the findings. Recommendations were then formulated to assist the staff in the revision of the district technology plan, and the conclusions and recommendations proffered were supported by the review of literature conducted during the process.

A Study of the Integration of Technology into the Instructional Environment of a Rural School District – Context and Findings

The small rural school district forming the focus of this study supported technology using a variety of funding mechanisms. The general fund budget for technology had increased over the last several years with the largest increase during the 2000-2001 fiscal year. This most recent increase was over 100% from \$40,000.00 to \$93,000.00. Funds from the general fund also supported staff development specifically designed for technology. Teaching and support staff perceived that they received support from technology coordinators, colleagues, and students. Technology coordinators at each building provided limited but beneficial support. Student volunteers provided support during the semester. The number of computers and other technology available to district staff had increased in recent years. One hundred and four computers were available in the district for teacher and student use. Every teacher had ready access to a computer. Some computers were networked and some had Internet access. Other technology reported as available by staff and students included DVD players, digital cameras, scanners, a mobile lab of wireless iMacs at the secondary level, a classroom set of Alpha Smarts at the elementary level, and super disk drives. Students, staff, and administrators reported that the district had implemented a student information management software package. This package afforded students and parents access to grades and assignments. Teachers and administrators reported using this software to manage grades, take attendance and lunch count, schedule classes, track discipline issues, and maintain current student demographic information. Administrators expressed optimism and satisfaction with the capabilities of the district's new student information management program, appreciating the efficiency it afforded their jobs. They also indicated that communication had improved with the online capability of the district. Parents had access to this student information via the Internet and this access was considered beneficial to students and parents.

However, staff reported that support in the form of in-service was not adequate. Many faculty members reported their life had changed as a result of the integration of current technology. Some openly expressed a reluctance to use technology because of a lack of knowledge on how to proceed. Apparently, some students had noticed this discomfort, suggesting that, "Except for the computer teacher and librarian, the rest of the teachers know only as much as we do or less."

Teachers reported they used technology most for student information management. The district purchase of the online student information management program changed the way grades, lunch count, and attendance were compiled and reported. This information was online so that students and parents could communicate with teachers or view the student information. Teachers also had the capability to communicate with students, parents, and each other through e-mail.

The faculty maintained that one of the best uses of technology at their fingertips was the Internet. Teachers and students used the Internet primarily for research and for development of lesson plans. This finding was consistent with the results of the faculty survey, given in May 2000, showing that "teachers used the Internet most often to do research for classroom projects, bookmark sites for student use, and supplement curriculum."

Current student technology use was managed by Board of Education Policy and a set of Guidelines for Student Technology Use contained in the student handbook, and the Acceptable Use Guidelines for Technology booklet, which stated acceptable and non-acceptable student uses of technology. Students, as well as their parents, were required to sign the agreement contained in the Acceptable Use Guidelines for Technology before students were allowed to use the Internet in the district schools.

In addition to the findings related to current support, parent usage, administrator usage, teacher usage, and student usage described above, other findings related to perceived needs and proposed support. For example, most respondents reported a desire for more opportunities to use technology for research, and both students and teachers indicated that technology should be more fully integrated into the curriculum and instruction. Teachers and administrators agreed that more effective training was necessary for successful implementation and suggested that additional training in how to use technology appropriately in the classroom was necessary as was the need for a full-time technology director and technicians to address technology issues. They also agreed upon the need for additional time to learn about and use technology. Some teachers were unaware of a long-term vision, or district level planning for technology use.

Conclusions and Recommendations of the Field Study

Following the description of the findings from this study, a picture of the state of the art of technology usage in this school district appeared, and a clear response to the first research question, "What does district data convey about the status of technology use within the

instructional environment?" was achieved. The study team then condensed the findings of the study as described above into the following categories of conclusions:

Current Support, Parent Usage, Administrator Usage, Teacher Usage, Student Usage, Perceived Needs, and Proposed Support.

This restatement of the findings into conclusion statements confirmed the response to the first research question and provided a more concise response to the second research question, "What are students', teachers', and administrators' perceptions regarding the technology needs within the instructional environment of the district?" A response to the final research question, "What would improve the integration of technology within the instructional environment of the district?" was provided by the study team in the form of recommendations which were derived from an analysis of the findings and a synthesis of the literature review and the technology experience and expertise of the members of the study team.

The study recommendations for the integration of the technology into a small rural school district follow:

- All stakeholders should be involved in all phases of the technology visioning and planning processes.
- A district-wide, shared vision should be developed collaboratively with stakeholders to guide technology use.
- The district technology plan should be updated to focus on integrating technology, student-centered activities, and targeted staff development.
- Formative evaluations of the technology plan should be conducted yearly.
- The allocation of funds for technology should continue to increase.
- Funding should be provided for full-time technology coordination / technical assistance throughout the district.
- Resources (personnel, financial, facilities, time, equipment) should be available to support the district plan.
- Access to the Internet should be made available to all students and staff.
- Training should be provided to all stakeholders for effective use of the student information management system.
- Staff development should be targeted to increase awareness of the potential of technology to transform the learning process to focus on student-centered activities.
- Student-free time should be regularly scheduled to assist professional staff in learning about technology.
- Results-based staff development for technology integration, should be targeted to learner skill levels.
- Support / encouragement should be provided all staff integrating technology into the learning environment.
- Emphasis should be placed on innovative ways to integrate the Internet into the learning process.
- Specific resources (websites, professional library, examples of lesson plans, network contacts, site visits, expert colleagues) should be made available to assist teachers to integrate technology into the instructional environment.

Conclusion

Several goals were achieved as a result of conducting this field study. Initially, the partnership between school districts and the local university was maintained and supported by achieving the mutual goals established during the development of the symbiotic relationship designed to foster shared responsibility and collaboration in the preparation of school leaders. Further, the internal goals of the school district were achieved through the development of a new orientation to an established technology plan. With this goal being achieved, the school district has been able to use the process and the report developed by the study team to provide direction for technology improvement efforts throughout the district, and has further used the report to motivate a process of teaching renewal in the district based upon the study recommendations. This district has also re-considered its approach to strategic planning and visioning for school futures to incorporate a more inclusive orientation to these activities, based upon the results of this field study.

Finally, the process of learning to do research during the process of conducting research has provided the graduate students in this program of leader preparation with the research skills necessary to conduct their own research whenever the need arises. Further, because the topic of the field study related to the integration of technology into the many learning environments of a school district, these future school leaders were provided with first hand experience of the intricacies of supporting a district wide approach to planning for effective technology use through participating in a full district evaluation of current information technology practices, needs, and expectations in preparation for the development of the next stage in an existing school district technology plan. Such a data based approach to the development of educational technology futures provided an information technology decision making platform for the target school district as well as providing a solid grounding for the future technology actions of neophyte researchers / graduate students / future school leaders when they assume the mantle of leadership in their own school districts. Unfortunately, the opportunity for future school leaders to experience such grounded technology based experiences in their leader preparation programs are few and far between. To increase the possibility for more of the future leaders of America's schools to experience targeted technology training similar to this, a national funding initiative is necessary. While it would be inappropriate to ignore the need to provide funds for the preparation of teachers in technology use, it would be equally inappropriate to ignore the need for funding opportunities for the teaching of tomorrow's technology leaders.

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NCATE Electronic Document Center and Beyond...

Bob Goeman
Technology Coordinator
University of Nebraska – Omaha
United States
bgoeman@mail.unomaha.edu

Neal Topp
Teacher Education – Associate Professor
University of Nebraska – Omaha
United States
ntopp@mail.unomaha.edu

Paul Clark
PT3 Grant Coordinator
University of Nebraska – Omaha
United States
pclark@mail.unomaha.edu

Abstract: With the changing of the Standards in the NCATE process, in addition to looking at the outcomes of the program, the University of Nebraska – Omaha has created an electronic document center that bridges the gap between hardcopy documents and electronic documents using the web. This presentation is based on the experiences and timeline that took place leading up to and during the site visit in the fall of 2001. As well as the information for NCATE, the document center has created a wealth of information that goes well beyond the site visit. Nevertheless, the document center is and will continue to be a valuable center for all faculty, staff, students, alumni, and the community to gather information. Come and see some of the information presented and also visit us online at: <http://www.unocoe.unomaha.edu>.

Introduction

Technology is a driving force behind many of the activities that occur in the College of Education at the University of Nebraska at Omaha. This short paper will review the technical aspect of the NCATE (National Council for Accreditation of Teacher Education) visit that occurred in November 2001. Three areas using technology were concentrated on for the NCATE visit. These areas involve: preparing for the document center, creating the document center, and using the document center.

Preparing for the document center started approximately a year in advance of the NCATE visit. The administration of the College met and discussed the unit standards of the institutional report. A draft of the institutional report was created and distributed to the administrative team for input in all areas including the overview and conceptual frameworks, as well as the six standards. Once the report was close to final form, the electronic document center began to take on a first draft look. The first electronic version of the document center was put together by linking certain key words in the report to web pages that supported that word or phrase. Upon watching this technique develop, it became very apparent that so many words were being linked to additional resources that it was becoming difficult to read and hard to pick out each individual link. Even though there was a space between the underlined words, it was very hard to distinguish between two separate Internet links.

After discovering that the first method was not very successful in creating an atmosphere that was comfortable in navigation, a new look had to take place. There was a direction but the team needed to step

back and look at the overall picture of what was needed with the electronic document center and how it should really be organized. At this point, a decision was made to create an index of what related documents support each section and not link directly from the report to the supporting documents. Some of this decision came from past experience of the people that had been involved in being able to easily locate materials according to a hardcopy index. Next, an electronic index was starting to be put together according to each unique section. Some of the documents were referred to in more than one section because it related to more than one section.

The electronic document center was produced and published online. We used a combination of web creation applications to facilitate the making of the page. We used a blend of simpletext and notepad with occasionally Claris Homepage, Adobe PhotoShop, Adobe Acrobat, Macromedia Dreamweaver, and Microsoft FrontPage. Different people created documents that were placed into the electronic document center and then my staff converted them to be web readable. Even though some pages were already in existence from having an ongoing web page, many more pages had to be updated or created for support of the documentation. We also linked to pages outside of our College. Therefore, we had to communicate with people at remote sites and verify that their information was updated and correct.

While the electronic document center was taking shape, one challenge was brought to the forefront. Given the list was getting very long, could the list be broken up to make it more manageable? A second challenge included a discussion that all documents may not be appropriate or practical to be online. Both challenges were brought to the administrative team for discussion and decision-making. As for the first challenge, we decided to have the index in two places. The first index would be a full index from the home page of the NCATE site and the second place an extracted version included at the end of each individual section of the report. This idea worked well also with the report itself. The whole report was available as a single long document, but it was also broken up into each individual section concluding with the extracted index that was referred to from the electronic index.

The second challenge was also overcome. A decision was made to not have everything online, but instead to categorize each document in the electronic index. The document could either be electronic only, paper only, or both. We would also duplicate the electronic index and include it with the hardcopy document center that was located in the NCATE team meeting room while they visited our institution. We also went a step farther and included a search engine that would only search the institution's local domain web pages. Many large search engines offer a University search that can be included in your site and indexed by their search engines. We decided to use the Google University Search engine to be included within our institution's web page. This was a critical piece that brought the index of the document center together with the website of the college. Many people have since used the search engine not just for NCATE purposes, but also for general day-to-day business that is conducted within the college.

Now that the document center index and report were close to their final stages, the college team discussed how best to get the information to the NCATE team. Our first discussion involved the use of the Internet and making sure that it continues to be updated and functioning. The NCATE team could always come to our website at any time and see all of the information that was in the web form. But, we know that not everyone can be connected all of the time. Many members of the visiting team have other jobs and other responsibilities, so we burned a CD (Compact Disk) for them to view our website from any computer that can read a CD. This allowed them to not have to be connected to the Internet, yet still be able to browse the documents that would give them some background to our institution prior to their visit. The downsides to this technique were the inability to get to other referenced websites and the search engine was automated and must be connected. Also, the CD was burned at a certain date, so any new and updated information was not included on it.

All three areas allowed our institution to have a successful visit from the NCATE team. Of course, there was more to the visit than aforementioned information, but it was a great learning experience using technology for communication and documentation for both the college team and the NCATE team. Feel free to visit the website to view some of the above-mentioned information at any time.

Web Publishing Policies: Ethical and Legal Issues

Gerrie Johnson, Southeastern Oklahoma State University, US

As a result of the interest exhibited by individuals at SITE 2001 to the information presented in my session 101 Reasons to have a Classroom Webpage, I have continued delving into the legal and ethical issues surrounding the publishing of students' work on the Internet. A questionnaire sent to a random sample of public school districts gathered data on current web publishing policies. The data will be examined during the poster session.

The poster session examines how the Family Right and Privacy Act, which establishes standards for student privacy in public education, impacts the use of Internet activities or projects. What caution must teachers take when publishing work created by children in their classroom? Do they have to be aware of more than simply not identifying students by personal information, such as, their first and last name, and addresses? Is this information addressed in their district web publishing policies? Is it an accurate assumption that all public districts now have web publishing policies?

The participants in the session will also have the opportunity to compare several web publishing policies in place this academic year. There are those that protect the students, teachers, and district without placing a burden on the teachers. Then, there are those web publishing policies that are so stringent that teachers feel it is not worth the effort to showcase their students' work. In some cases, the district's directive stating what can be on a teacher's web page and the policies for publishing students' work are intertwined. In those cases, one must examine the district's criteria for a teacher's web page in conjunction with publishing students' work.

The participants in the poster session will have the opportunity to assist in drafting a model web publishing policy for public school districts.

Computer Database Model to Teach Legal Issues in Principalship Program

Lawrence T. Kajs
School of Education
University of Houston-Clear Lake
United States
kajs@cl.uh.edu

Linda Grim McCormick
Alvin High School
Alvin ISD
United States
L.mccormi@alvin.isd.tenet.edu

John M. Decman
School of Education
University of Houston-Clear Lake
United States
decman@cl.uh.edu

Abstract: Principalship programs need to utilize technology in preparing school principal candidates in legal issues, since technology provides the benefits of acquiring, developing, and storing information in an effective and efficient manner. This paper describes the use of a computer database model and the Internet by principal candidates to study school law. Using the Internet, principal candidates developed a computer database model to better understand the legal and ethical issues in school settings. Technology assists future principals to advance their knowledge and application of school law; thus, addressing NCATE (National Council for the Accreditation of Teacher Education) Guidelines, ISTE (International Standards for Technology in Education) School Administrator's Standards, and Texas Principal Certification Competencies.

Introduction

Principalship programs need to prepare principal candidates with a strong foundation in school law. This is especially critical today given the litigious nature of society, the number of state and federal mandates in education, and the complexities of a pluralistic society. The NCATE (National Council for the Accreditation of Teacher Education) Curriculum Guidelines for Advanced Program in Education Leadership and the Texas Principal Certification Competencies directly address the need for principalship programs to prepare principal candidates in the knowledge and application of education law. Also, the ISTE (International Society for Technology in Education) Technology Standard 6 entitled "Society, Legal, and Ethical Issues" for School Administrators http://cnets.iste.org/tssa/view_standards.html highlights the need for preparation in relevant legal issues. Principalship courses like School Law, Administration of Special Programs, and Administration of School Personnel, are points of preparation in education law issues. Various types of pedagogical techniques, e.g., case study, are used in coursework. With the availability of computers and the Internet, another pedagogical approach can serve to develop principal candidates' knowledge and application of school law. This student-centered approach has principal candidates produce a computer database model using the Internet in a discovery process to study legal issues in school settings. This short paper will first present the features of the computer database model. Secondly, it will describe the implementation of the model, using a case study approach. Thirdly, it will discuss benefits in using the computer database model as well as suggestions for improvement, based on case study results.

Computer Database Model

The computer database model takes the form of a "matrix" or table of legal topics. The physical component is a Microsoft Word table, which is saved as a file on a floppy disk or other readable storage device. The table serves as a graphic organizer of legal information. The table is designed with columns of legal sources and rows of legal topics. The columns display those legal sources a principal should consider investigating in regard to a specific legal question. These columns could include federal and state statutes, federal and state regulations, and district (campus) policies, as well as appropriate forms/letters. The rows list the legal topics, and will vary from program to program. For instance a course entitled "Administration of Special Programs" could include special education, bilingual education, and gifted and talented education, to name a few. (See Table 1: Computer Database for Laws and Policies.) The next step in developing the computer database would be to create "links" to separate Word files of relevant education law content in the appropriate cells where the columns and rows intersect, using information from the Internet. For instance, the relevant state statutory law for discipline in Texas would include a citation from Chapter 37 of the Texas Education Code located at www.capitol.state.tx.us/statutes/edtoc.html.

Development of a Computer Database on Education Law and Policies: A Case Study

During summer 2001, thirty-nine principal candidates, who were enrolled in the graduate course entitled "Administration of Special Programs" at the University of Houston-Clear Lake, participated in using the Computer Database Model. In the computer lab, principal candidates were provided an instruction sheet for building the database table. Instructions were given for both Word 97 and Word 2000 since instructions did differ between the two versions of Word. This activity provided verification that participants possessed the proficiency in Microsoft Word to develop the database. With the construction of the database table, principal candidates were ready to research education law and policies to be appropriately placed in the cells of the matrix. The text in the "cell" was limited to a few words to identify the Word file containing the saved legal information. They could not simply place the substance of a Word file in the "cell" because it would swell the table in size to unmanageable proportions. They had to place a "link" in the "cell" to a related Word document. Participants "double-clicked" the "link" in the "cell," which opened the "linked" Word file containing the saved information in its entirety. Within this Word file, they could also add "hyperlink" web site URLs. As class discussions moved from topic to topic, the instructor provided principal candidates key Internet references. Participants were given websites containing text of the United States Code, the Code of Federal Regulations, and the Texas Education Code. Participants were also responsible for searching (discovering) other appropriate Internet sources, e.g., school district policies, to be placed in the database.

Benefits of Using the Computer Database Model

The pedagogical use of the Computer Database Model produced benefits to the principal candidates in the "Administration of Special Programs" course. The search or discovery process along with typing and cutting/pasting information provided an opportunity to actively engage principal candidates, in contrast to the lecture and note taking style of instruction. During this process participants realized that much pertinent legal information could be accessed on the Internet. They gained computer technical skills using Microsoft Word in constructing the database, which provided an electronic collection of legal information. Through the process of developing the computer database, principal candidates had a better understanding of legal concepts from federal and state laws and legislation to school policies. In one exercise, the class traced the evolution of a legal concept from a Supreme Court case, to federal regulations, then to state administrative guidelines, and finally to school district policy. The concept traced was special education's "child find." Participants followed its development from the *PARC* case (*Pennsylvania Association for Retarded Children v. Commonwealth*, 334 F. Supp. 1257 (E.D. Pa. 1971), 343 F. Supp. 279 (E.D. Pa. 1972), to federal legislation, then to state legislative and administrative directives, and finally to the school district's policy statement on "child find. Moreover, a discussion arose regarding the consequences of noncompliance and the possible litigation by advocacy groups. This process created the opportunity for participants to discuss differences between statutory law and regulatory law, both at federal and state levels.

Area for Technical Improvement of the Method

Complications arose when participants attempted to store the database on one floppy disk. Some of them were creative and divided the table into parts and saved them on different disks. Another technical solution would have been to save the database on a CD, but not everyone had access to a CD burner. A better solution would have been for participants to be selective in choosing pertinent information, instead of copying and pasting whole chapters of regulations and statutes. The value of the exercise in developing the computer database was not the amount of material collected, but in the knowledge gained regarding legal topics affecting educators and in the skills achieved in accessing those legal sources on the Internet.

Table 1. Computer Database for Laws and Policies

Legal Issues	Federal Statutory Laws	Federal Regulations	State Statutory Laws	State Administrative Guidelines	School District (Campus) Policies	Forms/Letters
Special Education	<u>Federal Legislation on Special Education.doc</u>	<u>Federal Regulations on Special Education.doc</u>	<u>State Legislation on Special Education.doc</u>	<u>State Administrative Guidelines on Special Education.doc</u>	<u>School District (Campus) Policies on Special Education.doc</u>	<u>Forms/Letters for Special Education.doc</u>

Preparing School Administrators to be Technology Leaders

Don Knezek
ISTE's National Center for Preparing
Tomorrow's Teachers to Use Technology
University of North Texas
United States
dknezek@iste.org

Abstract: This paper discusses the connection between leadership for technology in schools as documented in the Technology Standards for School Administrators, and accepted wisdom for leading systemic educational change. The information is of particular interest to programs designed to prepare school and district administrators.

Using technology well across a school system is, in itself, significant systemic reform. When technology is appropriately integrated system-wide, work is different and who does what work changes. With the infusion of technology, tools change, learning resources are different, and learning environments are transformed dramatically. Supported by modern information technologies, communication changes, and decisions are made very differently. Educators and school leaders who understand technology and its roles in schooling and in society establish new priorities, and they highly value new learnings.

The single most important element for success and sustainability of systemic change in education is effective leadership. Evidence gathered from study of organizational change in general, and change within schools specifically, is consistent and very clear on this fact. Effective leadership of school change is the essential condition to successful change.

It is a tiny leap of logic and faith, then, to conclude that effective leadership for technology in schools is critical to success and sustainability. In fact, direct evidence arising from major systemic technology initiatives serves to confirm the important role of leadership. And it is precisely this observation that attests to the incredible importance of the administrator standards projects of the Collaborative for Technology Standards for School Administrators and of the ISTE National Educational Technology Standards (NETS) Team.

Within a framework of effective change characterized by:

- a shared vision and clear expectations,
- support strategies and essential conditions,
- ongoing, broad-based assessment and evaluation, and
- meaningful and substantial response to assessment and evaluation findings,

ISTE National Educational Technology Standards for Administrators, or NETS*A, present a rich package of guidance and support well positioned to return optimal educational benefits on our technology investments.

Effective technology leaders understand the roles technology plays in schools and in society. They establish a shared vision among all stakeholders that succinctly captures the expectations of the school community for a focus of technology use in the enterprise of schooling. Through an emphasis on standards and benchmarks, the administrator clearly and frequently reminds all involved of the expectations of them related to technology.

System conditions related to access and connectivity, supportive policy, modern infrastructure and technical support, expectations of continuous improvement, standards-based curriculum, student-centered learning activities, and community support are priority concerns of the administrator committed to providing necessary system support to achievement of technology expectations.

Using a wide array of sources, strategies, and measures to assess and evaluate achievement of the shared vision for technology within a system of schools, the technology leading administrator keeps both self and colleagues-in-leadership in touch with an authentic picture of progress. The administrator leads staff and stakeholders in collaborative review and interpretation of data and information pertaining to technology use and school effectiveness.

Finally, in the fourth critical phase of this cyclic formula for leadership of educational change, the effective technology leading administrator guides an inclusive process of establishing and executing responses to assessment and evaluation findings.

So, the bottom line? The picture for leading effective integration of technology is coming into sharp focus, and our best guide is knowledge we already have in our grasps about successful and sustained systemic change in education.

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Teacher Change Processes and Student Products of Exemplary Technology Integration Sites in Kansas

Marilyn May, Brenau University, US

Research Abstract

Accountability for public investment in educational technology has been reported in terms of quantity of equipment and infrastructure ["1st generation"], not in terms of classroom technology curriculum integration with teachers as stakeholders ["2nd generation"] (Milken, 2000). Level of teacher use is key factor in evaluating effectiveness of technology on student learning (ISTE, 2000; US Dept. Ed., 1999; CEO Forum, 2000), yet no studies to date have focused on practitioner use with standardized national frameworks used for data analysis.

Research consensus concludes that technology curriculum integration is needed, as is stakeholder involvement in planning, implementation, documentation, and assessment (Hansen, 1995). Lewis (1998) and others call for more empirical research on actual instances of curriculum change, with school districts, schools, and teachers as units of analysis.

The purpose of this study was to increase contextual knowledge of integration of technology into individual school classrooms by examining teacher-identified classroom change processes and products brought about by technology used in exemplary schools. Qualitative naturalistic inquiry using the grounded theory, issue-based approach (Guba & Lincoln, 1989; Stake, 1995) provided data, which was reported in a case study format. Interviews, documents, and records were used to develop contextual knowledge (Yin, 1989). A panel of state experts both defined exemplary technology integration and identified model sites for participation. Criterion sampling allowed stakeholders to identify exemplary peers for the study. Bloom's taxonomy, the STEP model, the ISTE Technology Foundation Standards and Milken's Seven Dimensions of Progress Technology Evaluation Frame were used for theme analysis.

Constant comparative analysis and open coding of a variety of information from "elite" interviews allowed for thick identified-site descriptions and theme emergence. Cross-case analysis developed key themes which emerged from the data. Meta-analysis provided a basis for naturalistic generalizations and assertions. Naturalistic generalizations can then be used for extrapolation to similar circumstances and reflection in relationship to established frameworks.

Cross-site analysis identified levels of technology integration development within the exemplary models and a greater connection of higher levels of development to teaching teams and supportive mentoring than to funding per student. The ISTE framework identified assessment/curriculum, teaching methodology, and classroom structure to be areas of change present at any level of technology integration development. Findings supported the need for more effective district wide planning and teacher training that incorporates the use of team mentoring for support.

Levels within data were indicative of technology integration demonstrated progress along a continuum comparative to the Seven dimensions of progress (Milken, 2000). As progress was made toward higher levels of technology integration, hardware and software moved from center of process focus to a support position for the content activity and issues of equity of access became critical (meta-assertion).

District technology coordinators were found to be key resources in the development of effective technology integration programs. Organizational support for coordinators needed to be directed toward providing access to resources, current literature, and training opportunities (meta-assertion).

Findings analyzed using the ISTE model of classroom change exhibited discrepancies in terminology and pedagogy, which emphasized the need for more effective teacher training. Emerging themes support the meta-

assertion that defines the needs of staff development to provide ongoing technology skill training, distribution of current literature shaping technology integration in education, and demonstration of effective integration models with mentoring or cadre teams to support change. Teachers were enthusiastic about technology integration but frustrated with limitations of time and training necessary to maximize the potential of technology as an effective educational tool.

Time and funding needs increased as technology integration improved (meta-assertion). "Time factors" included not only time to plan and experiment with technology applications but also the added time needed for students to accomplish in-depth assignments that utilize technology. Student work time leads to the issue of funding needed to supply equity of access. The greater the level of technology integration the greater the need for student access. Technology resources shape classroom activities and ultimately the learning opportunities available to students. Resources must be available and directed toward providing equity of access for students.

All reference to changes in student products failed to include a reference to standards, assessments, or scores. Lack of student achievement data indicated a great need for alignment of content and technology standards with outcomes and assessments. Without this connection it is impossible to validate improvements in learning that teachers believe is produced by technology integration. Research findings support the meta-assertion that alignment across all sites between technology and content standards, district outcomes, and assessments needs to be addressed by curriculum and technology planning to provide student achievement data.

Technology planning is critical to all aspects of implementing an effective program. Although formal Technology Plans exist, evidence has identified this as an area of constant change creating the need for improvement. Effective planning must incorporate information collection and distribution representing administrators and teachers. It should provide direction, pinpointing areas of need from physical resources such as hardware and software, to curriculum and instructional goals that integrate technology standards with content standards and outcomes (meta-assertion).

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Developing a Relevant Technology Course for Administrators

Barbara K. McKenzie, Department of Media and Instructional Technology, State University of West Georgia,
United States, bmckenzi@westga.edu

Nancy G. Mims, Department of Education Leadership and Professional Studies, State University of West Georgia,
United States, nmims@westga.edu

Abstract

The design, development, and evaluation of a technology course for school administrators and instructional technology leaders is presented. This paper reviews two years of course design stages including the content changes, teaching/learning modifications, more and less successful teaching practices and student requirements. Design considerations, future directions and future research are presented.

Introduction

Integrating technology into the school's curriculum require teamwork in order to infuse it seamlessly into the curriculum (Brooks, 1997). While significant efforts have been made towards improving technology training for teachers across the nation, administrators have not received the same attention (Hope, Kelley, et.al 1999; O'Neill, 1999). Despite this lack of emphasis school administrators must make sound decisions when it comes to providing leadership of their school's technology plan.

Several studies indicate that administrators knowledge in technology make a positive difference when supporting technology use in schools. (Anderson & Pigford, 1987; Thomas, 1999; Virginia Department of Education, 1998). Costello quoting Mergendollar (1997) stated, "The role of the principal is crucial in promoting school technology use. For technology to become diffused across a district, leadership by the central administration, especially the superintendent, is critical." (58). In a previous study Mims & McKenzie (1995) also found that administrators knowledgeable in technology were more inclined to support instructional media (1995). Technology training is important if principals are going to have the necessary knowledge to administer and oversee the school's total technology program (Mohr & Evans, 1999). This includes developing a school technology plan, purchasing hardware and software, providing technology support, offering curricular integration training programs, and overseeing the school's technology assessment.

The Educational Leadership Department at a medium sized southeastern university began the planning process for adding a master's level component in technology to their administrative program. Some courses did include technology, however, not to any great extent and the department decided to add Administration of Instructional Technology Programs to its required courses.

The class was a collaborative effort between the departments of Media and Instructional Technology and Educational Leadership and Professional Studies. The course was designed for students who were working on a M.Ed. in the Educational Leadership and a M.Ed. in Instructional Technology.

Because many non-traditional students are working full time, many traditional classes are disappearing from this campus. An increasing number of students want classes delivered through online technologies either as a course supplement or a full course. This format offers many advantages to students seeking to continue their education. These advantages often include access to their course at any time /any place so individuals determine the hours of working online, the pace in which to complete work, and control of their learning environment. Knowing the students' schedules and their need for flexibility and access, the planning team designed the initial course 52% online.

The Design and Implementation of the Course

The research team redesigned and implemented the first course for technology leaders in the school (principals, teachers, instructional technology trainers) fall of 2000. One member of the team was a faculty member

in the Educational Leadership and Professional Studies Department who had extensive experience in instructional technology, and who was familiar with the needs of the master's level students in Educational Leadership. The other member was in the Media and Instructional Technology Department, taught the class, and was an instructional designer. Since a similar course was in place for instructional technology master's level students, the two faculty members examined the existing course objectives, activities, evaluative measures and teaching strategies.

The course designers considered students' needs in both disciplines, reviewed accrediting standards in technology for administrators and instructional technology leaders, reexamined course content and evaluation techniques used in the course, and modified many of the teaching and learning strategies to better meet the needs of all learners. Some of the initial changes included providing more hands-on technology training, increasing the technology software covered, adding several new content areas such as grant writing, state and federal laws and funding.

The course delivery was changed from a face-to-face class to a 52% on-line course delivered through the WebCT platform. The course designers wanted to prepare students for the future by exposing them firsthand to distance technologies. Nine of the 17 class meetings were online and 5 were face-to-face. During the first class students were given an introduction to WebCT, shown the course tools, and how to access the course. The other face-to-face meetings were used for presentations from experts in the field and/or the instructor, hands-on training sessions with selected computer applications, and student's research presentations. The online classes provided students with weekly assignments, course content, opportunities to use the web for searching for technology related material, posting assignments in the class bulletin board, and taking exams.

The online content section contained a wide variety of information such as the weekly assignments, student research topics, instructor presentations and training tutorials that included PowerPoint, Excel, Access, laserdisc, overhead production, analog video, web page design, e-mail.

The fall 2000 course introduced the educational leaders to a variety of technology topics. The research team believed that the more familiar students were with technology, the more they would be able to model its use and oversee effective integration into the schools. The major course components included some of the following: knowledge of the use of computers and related technologies in the schools, hands-on training with software programs addressed by In-Tech, school technology plan, staff development, integrating technology, technology resources, grant writing, fundraising, and technology for special needs students.

During the course students were required to participate online and complete class assignments by posting their work or their group's work on the bulletin board. They were required to do research in technology on selected topics and make two presentations using multimedia, develop an instructional manual based on class materials, and take two online exams. The grade breakdown was as follows: attendance and participation = 10%, research project on IT issue = 20%, group research and multimedia presentation = 25%, IT manual = 25%, and tests = 25%.

The course offered every semester during the past year and a half has varied in utilization of distance technology. Spring of 2001 the course was 71% online. During the summer the class was reduced to 64% online. Fall of 2001 the course increased its use of distance technologies to 65% online as a result of using two distance platforms, WebCT and Epic Learning.

As the technology standards for school administrators have emerged, Technology Standards for School Administrators (TSSA) and the International Society for Teacher Education (ISTE) standards for teachers and technology leaders developed, the research team made course modifications to reflect the new standards. Course objectives were revised and additional content was added to the course. Some of the changes were:

- Adding more hands-on technology training opportunities to keep technology leaders up to date. This included more training sessions in class, distributing handouts, and posting tutorials on the class web page (i.e., digital cameras, digital video recorders, filtering software, track star, scanner, smart board, web page design and creation, web quest). One of the researchers was taking her second In-Tech class and scanned and posted the In-Tech handouts for the class.
- Adding more technology/ leadership content (i.e., social, legal and ethical issues; distributive learning; assessment of technology integration in the schools; assessment tools for technology, teaching with a one computer classroom, DSL, and filtering devices)

From the fall 2000 to the present time, the Administration of Instructional Technology class has been revised based on the research team's observations, formative and summative evaluations from the instructor, the university, the Distance and Distributed Learning Office, and the changing student needs and attitudes toward technology. The advances in telecommunications have also had an impact on the course design. Technology training needed to be up to date and prepare the students for new and emerging types of technology as well.

Findings from the general university course evaluations revealed the mix of students favorably received the course. The most frequently occurring suggestions for improvements were:

- Reduce the amount of course content presented
- Reduce the number of required online postings for class assignments
- Use Epic Learning for more classes to increase student/ instructor interactions online
- Increase the weight given for student attendance and on-line participation in class
- Do not require so much collaborative work
- Change the book. The online resources are much more up to date and informative.

The evaluative data from the Distance and Distributed Learning Office for fall of 2000 and spring 2001 also revealed the Administration course was effective in its delivery. Students, volunteering to take an online course evaluative survey at the end of the course, were supportive of distance technology being used for this course as shown in table 1 below.

Statement	SA	A	U	D	SD
At the beginning of the quarter my attitude was positive	6	2			
At the end of the quarter my attitude is positive	6	2			
My instructor was positive about the online component of this course	7	1			
I found WebCT easy to understand and utilize by the 2 nd week of class	3	4		1	
I now find WebCT easy to use and understand	6	1		1	
Having the flexibility to contribute to class discussions outside the classroom on my own time was valuable to me	7	1			
I feel more comfortable participating in class online that I do in a face-to-face setting		2	4	3	
The Distance Learning Help line was helpful	2	1	4		
I would like to take classes in the future that are mostly on-line	6	3			
I would like to take classes in the future that are completely on-line	4	3	1		

Key: SA = Strongly Agree, A = Agree, U = Undecided, D= Disagree, SD = Strongly Disagree

Table 1 - Student Evaluations from the Distance and Distributed Education Office (fall 2000 and spring 2001)

Table 2 summarizes student comments made about the likes and dislikes of the course. Students appreciated the convenience and flexibility the courses offered them but felt there were too many required weekly assignments.

Likes	Dislikes
• Not having to drive a long distance to class • Allowed for better time management • Provides an educational opportunity for those who work and have a home life • Provides an opportunity to hear from all classmates • Easier to communicate with the instructor and class • Time to prepare for the face-to face-discussions • Ability to revisit prior discussions on WebCT • Convenience of taking classes at home	• Too many weekly assignments • Occasional problems posting weekly assignments to WebCT • Too much information too fast

Table 2 – Students likes and dislikes with the course (fall 2000 and spring 2001)

Design Observations

In preparing future technology leaders in this course the research team is aware of the following important points.

1. Teaching through distance technologies is an effective way of delivering the class as long as there are ample opportunities for students to interact with other one another and the instructor. This can take place through chatrooms, bulletin board posting, private e-mail, and using the Epic Learning's platform for synchronous presentations and enabling students to use two way audio.
2. Students enhanced their technology skills and expertise as a result of the taking the course. Many students were highly motivated to continue their professional development after the course was completed.

3. Participants in the class gained a better perspective of instructional technology and where it is headed in the future. Information on new and emerging types of technology was of high interest of the students.
4. Students with little technology background have difficulties with online platforms initially and must be monitored closely to ensure they succeed and have the support as needed. Help lines, virtual office hours for the instructor, handbooks on how to use the system, and the class bulletin board or e-mail are helpful in student problem solving.
5. Due to students' diverse learning styles, they need to be given options in collaborating with other students in class. Permitting students to work independently or in small groups when completing assignments was well received.
6. Class participation should be at least 20% of the grade. Since most of the assignments were online students spent a substantial amount of time searching for information, problem solving and posting their assignments and/or e-mailing their classmates. The weight of the class participation aspect of their grade needs to match the amount of time the student put in to the course.
7. Timely feedback is essential when doing online classes. Students need to have access to the instructor and receive timely feedback on class work. Posting online office hours or listing the days and times the instructor will check the class is helpful to students.
8. The creation of student PowerPoint's at the beginning of the course to introduce themselves (along with a digital photograph) was an excellent way for students to get to know one another.
9. Posting rubrics used in evaluating assignments was an effective method of informing students of the expectations on major assignments. Students used this as a checklist for self-assessment purposes.
10. After completing the class students saw themselves as role models and were eager to serve as leaders in integrating technology into the curriculum.
11. The mix of multimedia used by the instructor provided students with an opportunity to see technology use modeled in the classroom as well as present timely information in instructional technology (i.e., textbook, handouts, instructor produced videotapes, and online resources).

Future directions

Spring of 2002 the class will be delivered 70% on-line and a printed textbook will continue to be used. WebCT will be discontinued and Epic Learning used to distribute class information to students online. This platform is more user friendly and enables students to access course information from a single page instead of going back and forth in the course web pages. The blended learning approach provides increased interactivity between students and between students and the instructor.

From the weekly schedule of events students will be able to access information on their assignments, go to websites connected to the topic, review weekly assessment procedures, participate in selected web based tutorials (i.e., PowerPoint, Excel, Access, Word) and view archived presentations. Students will also be able to see when asynchronous class sessions are scheduled for class chats or real time PowerPoint presentations.

During the real time PowerPoint presentations delivered by the instructor using the Epic system, students will be given a wide variety of tools to use. This includes the polling of student responses to instructor-designed questions (i.e., student background, class pace, content related questions), students typing questions during the presentation and sending them to the instructor for feedback, students verbally asking questions of the instructor through the use of a microphone, and small group e-mail discussions between students and/or the instructor when seated in the same row. The platform also will enable students to use seat colors in the presentation room to indicate their readiness for the presentation and/or to identify problems as they emerge. If both students and the instructor have microphones, two way audio communication will take place between students and the instructor.

The instructor's control of the learning environment is greatly enhanced through the use of the Epic platform. During live presentations the instructor can push web pages to students to have them explore and problem solve. Instructors can also deliver team taught classes through the use of multiple computers by releasing control back and forth. A white board can be posted and used by students and/or the instructor to display information to the group. Other useful features include student tracking of course activities and a variety of presentation enhancement tools to highlight selected course information within the PowerPoint slides.

During summer of 2002 all online resources will be used for the course given the rapid changes in instructional technology. Students have reported they enjoyed their online readings and learned more from them

than the class textbook. The timeliness of the materials, the no cost factor, and accessibility have been the predominant reasons given for this preference.

A more extensive student orientation program is in the process of being developed. This will include a more thorough needs assessment at the beginning of the course plus moving student verbal and electronic self-introductions to the first and second nights of class. This may increase student-to-student interaction during the course and reduce the number of times students report to the instructor. The number of postings on the bulletin board should be reduced in the future. At the end of the fall course students read over 750 postings. They reported this was too much to read plus keep up with the other required course assignments. More controlled topics for bulletin board discussions and added emphasis on student-to-student interactions on weekly assignments may better meet students' needs. In addition, students will be placed into collaborative learning groups, randomly matched by the computer. Groups of 3 to 4 will be formed so students can share their ideas with the group, problem solve and post their collective thoughts to the bulletin board.

The research team continues to keep abreast of the changes in instructional technology and student needs in order to make further course revisions. Wireless computers, virtual reality, and e-learning will be addressed in more detail in the future so that as effective leaders students will be familiar not only with the existing types of technologies in the field, but the new and emerging technologies.

Future Research

Informal formative evaluation techniques that obtain feedback from students in this course and assessing the effectiveness of this course after technology leaders are working in the field will be valuable.

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Understanding the Role of School Leaders in Realizing the Potential of ICTs in Education

Thomas L Otto

Department of Education, University of Southern Queensland, Australia, otto@usq.edu.au

Peter R Albion

Department of Curriculum and Instruction, Purdue University, USA, palbion@purdue.edu

Abstract: Although Information and Communications Technologies (ICTs) are now widely available in schools they appear not to have been integrated into teaching and learning either as widely or as thoroughly as was hoped. One influential factor, which may not have been given the attention it deserves, is the role of school leaders. Relatively little is known about how the beliefs of principals influence the uptake of ICTs in their schools. This paper attempts to describe a conceptual framework for understanding that role and an exploratory research project based upon that framework. It opens new lines of enquiry about the crucial roles of school leaders in the adoption of ICTs.

Information and communications technologies (ICTs) are now widely available in schools. The level of equipment available and its quantity vary widely but there is both wide support for, and considerable progress in, deployment of ICTs in schools. In 2001, USA schools were reported to have one computer for every 5 students on average and around 60% of those were connected to the Internet or had multimedia capabilities, although there were substantial variations by state and other factors (Education Week, 2001). In Australia, 40% of schools report having a computer for every 10 or fewer students (Meredyth, Russell, Blackwood, Thomas, & Wise, 1999). An international survey conducted in 26 countries during late 1998 and early 1999 found ratios ranging from 7 students per computer in Canada to 238 in Bulgaria but with the most common values around 15 (Pelgrum, 2001). The same study reported evidence that, for most countries, the availability of computers in schools had increased from 1995 to 1998 suggesting a continuing commitment by education authorities to support the adoption of ICTs. Nevertheless, "insufficient number of computers" remained the top ranking obstacle to integration of ICTs although its prevalence was considerably less in those countries with the most favorable student/computer ratios.

Integration of ICTs in Education

However, mere deployment of ICTs in schools is not sufficient to make an educational difference. For that to occur the ICTs must be used purposefully. Even where access to ICTs is comparable there are variations in both the kind and frequency of use to which the equipment is put. In the USA, computers are reported as being used weekly for language arts in 26% of classes at Year 4 and just 8% at Year 8 with the respective state to state variations reported as 8% to 74% and 2% to 20% (Education Week, 2001). The same report describes similarly wide variations in usage by teachers for other purposes. Internationally, on a composite measure of skills acquisition during secondary education, the reported variation was from 21 to 70 on a 100 point scale (Pelgrum, 2001). The application of ICTs to teaching and learning has been aptly described as "patchy" (Galligan, Buchanan, & Muller, 1999).

Various reasons have been offered for the failure of ICTs to produce widespread changes in education. It has been argued that developing teachers' technical competence with ICTs is not sufficient in the absence of building knowledge about how to apply ICTs to teaching and learning (Oliver, 1994). Even the effects of such knowledge may depend upon attitudinal factors. It has been suggested that teachers' self-efficacy for teaching with computers (Albion, 1999) and their visions for integrating technology in their teaching (Ertmer, Johnson, & Lane, 2001) are factors which may influence the uptake of ICTs for teaching and that these are issues which should be attended to in teacher development programs. Becker (2000) examined Cuban's claim that computers are incompatible with the requirements of teaching. Using data from a study of 4000 teachers in 1100 schools across the USA, Becker

concluded that computers have not transformed the teaching practices of a majority of teachers but that, where teachers have the necessary computing skills, some freedom in the curriculum, convenient access to equipment and personal philosophies which support constructivist pedagogy, computers can be a valuable instructional tool.

Australian policy lists two goals for ICTs in schools, namely that students should exit as "confident, creative and productive users of new technologies" and that schools should integrate ICTs to "improve teaching and learning" (Toomey, 2001). The same report expresses the hope that ICTs may act as a catalyst for whole school reform. However, there is evidence to suggest that, rather than ICTs catalyzing educational change, the adoption of ICTs by teachers is most likely to occur where school culture provides support for such changes (Dexter, Anderson, & Becker, 1999). These findings are consistent with studies of exemplary computer using teachers, which identified the importance of contextual factors including support from peers and administrators (Becker, 1994; Hadley & Sheingold, 1993). Further evidence may be found in studies on factors influencing teachers' adoption of computers based on which Marcinkiewicz (1996) concluded that the most influential factor was "subjective norms" or the perception within the professional environment that computer integration is expected. He argued for the importance of modeling by administrators, colleagues and other significant persons in establishing this expectation.

The Role of Leadership in ICT Integration

ICTs can be a valuable instructional tool where the appropriate conditions prevail (Becker, 2000). Many of those conditions, including professional development opportunities to build skills, convenient access to ICTs and freedom to innovate in the curriculum are subject to the influence of principals and other leaders in the schools. For teachers, developing a coherent vision for integrating ICTs into their practice while attending to various other imperatives represents a significant challenge, especially if the school culture is not supportive of such change. In Britain, the National Grid for Learning (NGfL) project has recognized that achieving its long term goal of fully integrating use of ICTs into all aspects of the school system will require a cultural shift in the way schools approach ICTs and that this, in turn, may necessitate "a considerable change in the roles that school leaders and managers will be expected to play in their institution's use of technology" (Selwyn, 2000, p 410).

Recent studies of successful school reform point to the importance of cultural leadership in schools. Consideration of the leadership dimensions associated with successful innovation in an Australia-wide study of school innovation led to conclusions which indicated the importance of an holistic approach, in which innovation is aligned with school-wide vision and shared pedagogy so that it meshes with school culture, and where leadership incorporates the contributions of both administrators and teachers (Crowther, Hann, & McMaster, 2001). A study involving 40 public school teachers in Ohio found a positive correlation between leadership style exhibited by the school principal and teacher attitudes towards integration of technology as an instructional tool (Hughes & Zachariah, 2001). Teachers who perceived their school leadership as democratic were much more likely to have positive attitudes towards technology integration than teachers who experienced authoritarian leadership.

Another report based on data from the study described by Becker (2000) examined the proposition that "technology leadership" drives "technology outcomes" in schools (Anderson & Dexter, 2000). The "technology outcomes" investigated were evidence of teachers integrating technology into teaching, network and Internet utilization and student use of applications. "Technology leadership" was conceived of as a characteristic of the school rather than an individual and a measure was synthesized from data about eight organizational policies or actions present in the school. These included existence (or not) of a committee and budget for technology, principal involvement in technology use and planning, district support and staff development. The study found that overall technology leadership was stronger than infrastructure as a predictor of technology outcomes and that leadership and student to computer ratio were the only significant predictors of the three outcome variables. It concluded that, although infrastructure is important, leadership is the critical element in establishing technology as a part of school culture.

Recent efforts by a broad collaborative in the USA have resulted in the development of Technology Standards for School Administrators (Knezek, Rogers, & Bosco, 2001). Listed first among the six tasks in the framework is "Leadership and Vision". The remaining tasks include learning and teaching; productivity and professional practice; support, management, and operations; assessment and evaluation; and social, legal, and ethical issues. Clearly the capacity of school principals to develop and articulate, in collaboration with their school community, a vision for ICT integration is seen to be a critical element in the process.

The Role of Principals' Beliefs in Leadership for ICT Integration

Even if "technology leadership" is a characteristic of the school community rather than an individual such as the principal (Anderson & Dexter, 2000), a strong case can be made that principals' beliefs and understandings are crucial in the development of a school culture that will support creative integration of ICTs for teaching and learning (Otto, 2001). Understanding the nature and origins of principals' beliefs may be the first step towards assisting principals to work more effectively to develop appropriate school visions for the integration of ICTs. Prior research, including self-efficacy theory, provides a useful starting point for developing a framework to guide such research.

Bandura (1997) defines self-efficacy as the "beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments" (p. 3). In the context of this paper, "beliefs in one's capabilities" refers to the confidence a principal has in his or her beliefs about teaching with ICTs, and "courses of action" refers to the effectiveness of the principal as a visionary and agent for change. Non-teaching principals have few opportunities to test their beliefs in a classroom over extended periods of time. While a principal may have read about teaching with ICTs and observed teachers teaching with ICTs, personal classroom experiences may be limited to print based pedagogy. Principals with low self-efficacy for leadership in respect of ICTs may be less willing to advise teachers, and their evaluation of teaching with ICT may be limited to comparisons with print based pedagogy. However, at some point, pedagogical principles for teaching with the new technologies depart from print-based learning, otherwise teachers will use the technologies in the same way they use print. This is one of the problems identified by educational commentators such as Luke (2001).

In their study of the relationship between self-efficacy and willingness to act, Dimmock and Hattie (1996) concluded that high self-efficacy is not only a factor in creating conditions for change, but also reduces principals' stress levels and enables them to cope with unfamiliar situations and challenges. As well, high self-efficacy is linked to school reform because the principal has the confidence to take advantage of new opportunities. Self-efficacy is an element of empowerment, that is, 'taking charge of ones own growth and resolving ones own problems' (Ghaith & Shaaban, 1999, p. 495). Furthermore, principals with high self-efficacy are more likely to assume collaborative leadership styles and allow participative decision making, while maintaining confidence in their influence as leaders (Dimmock & Hattie, 1996).

Planning a Way Forward

A study is proposed to develop an understanding of critical factors and identify key variables as they relate to the 'beliefs and understanding' principals hold in relation to ICTs and teaching and learning generally. Based on consideration of the literature the following research questions have been identified.

1. What beliefs do principals hold about teaching with information and communication technologies?
2. What factors appear to be significant in the formation of those beliefs?
3. How confident are principals in rationalising and articulating the educational value of teaching with information and communication technologies?

The researcher, who himself is a principal, will be one of three principals to participate in the study. This is to account for beliefs that the researcher brings to the study (Miles & Huberman, 1994). The focus is on understanding the cases (Hammersley & Gomm, 2000) rather than making statistical generalisations to the population although that might follow in a later phase. A story for each 'case' will be developed during a series of structured and semi-structured interviews, or episodes, that draw on a range of research techniques. Contact will be made with the principals over approximately one month, during which leads will be followed, interesting concepts pursued and perceptions checked and rechecked. Care will be taken not to force a view on the principals, nor to introduce terms that give clues to answers. Narrative research techniques will be an important feature of the episodes. According to Mattingly (1991), narrative accounts focus on the changes that occur through the actions of people, and that "Simply asking practitioners to reflect on the stories they already tell can provide a natural bridge to a serious enquiry about the very deepest layers of value and belief that under gird the decisions they make" (p. 255).

Biographical research techniques will be applied in the first episode to investigate factors in the principal's development of knowledge and skills in pedagogy and ICTs. Questions modified from an Australian national study will center on pre-service training, teaching experiences, lesson observations and in-service development (Meredyth et al., 1999). Additionally, there will be questions about home use of ICTs as this is another important area of experiences. Each principal's responses may be compared with national data.

During one of the episodes, questions will relate to scenarios of traditional and constructivist teaching practices (Ravitz, Becker, & Wong, 2000). In another episode, the principal will be asked to react to statements made by teachers talking on video about their experiences in teaching with ITC. The video was produced by Gibson and Albion (1999) as part of a computer file package to support pre-service teachers, and depicts classroom scenes and issues familiar to principals of Queensland schools. "Through reflection, (the principal) can surface and critique the tacit understandings that have grown up around the repetitive experiences of a specialized practice, and can make new sense of the situations of uncertainty or uniqueness which he may allow himself to experience" (Schön, 1983, p. 61). Even if the principals are aware of related theories and techniques, they may find it difficult to explain reasons for their judgments of teaching, including the statements made by teachers on video. To assist the principals in the process, Schön recommends that questions focus on noticeable features, criteria in making judgments, procedures enacted in performing the skill and framing of the problem that is to be solved.

Additional data will be collected from school documents including the Annual Operation Plan, Management and Learning Technology Plan and Equipment Replacement Schedule. The principals will be asked to highlight features in the documents, not only as a reflection of their beliefs in practice, but also because principals with high self-efficacy are more likely to be aware of the potential of school planning and policy making in developing their schools (Dimmock & Hattie, 1996).

At the conclusion of each episode, the principals will rate their confidence in discussing their beliefs on a five point Likert scale. The procedure relates self-efficacy to confidence and assumes that principals are conscious of their self-efficacy (Dimmock & Hattie, 1996). To improve honesty of answers, they suggest the principal be assured the information is confidential, and the situations presented include a range of tasks with positive and negative aspects and differing levels of difficulty.

During the course of the study, the process of collecting data will itself become a factor. The subjects themselves will become researchers as they reflect on their beliefs and activities in their schools (Mattingly, 1991). In the relatively new field of teaching with ICTs, principals "handle situations for which there are no techniques. They must develop their own kind of artistry, involving reflecting in practice in the midst of intense activity without interrupting the flow" (Schmidt, 2000). Participation in the study will provide the principals with an opportunity to reflect on their beliefs without the distraction of school routines. They will consider scenarios in various forms and make comparisons with practices in their schools, and for a period of a month their attention will focus on one topic. By being aware of this effect on the principals, the researcher may detect changes in beliefs not only as a feature in the data, but also as a record of the potential of the process to assist principals in their development.

It is anticipated that the data obtained from the study will open up new lines of inquiry about the crucial roles of school leaders in the adoption of ICTs. Schools are in the transition of re-culturing to accept teaching with information and communication technologies. Education Queensland, for example, is undertaking curriculum reviews that oversee major changes in approaches to teaching and learning. Unless schools begin to address change now, they will soon be left behind. Principals are the on-site educational leaders who shape and communicate visions of teaching and learning within their schools, and by their action or inaction influence school activity. An evaluation of the beliefs, understanding and self-efficacy of principals will contribute to decisions about future developmental needs because more will be known about their preparedness for change. The contextual information about existing processes for developing skills and knowledge in pedagogy and information and communication technologies will further contribute to those decisions.

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Disinformation, Academia, and the Web: The Anonymous Battleground

Thomas Rakes, The University of Louisiana, US
Glenda Rakes, The University of Louisiana, US

Disinformation, Academia, and the Web: The Anonymous Battleground

Introduction

Before the Internet, much information spread as one friend told something to another. Although not very efficient by today's standards, it was powerful because the source had credibility. People tend to put more faith in the opinion of a friend or than in the pronouncements of any anonymous source.

Now that email and the Web are everywhere, the change in the speed with which word of mouth communications travel is nothing less than amazing. Expending less energy than was previously required to convey information one-to-one, a message can now be transmitted, with little to no cost and instantly, to enormous groups of people. With a very basic Web site, almost anyone can instantly post a cyberspace billboard that can be viewed by the world. Message boards, online forums, discussion groups, and chat rooms also allow nameless messages. And that anonymous person can feel like an instant friend with all the credibility of a fraternity brother.

Companies felt the sting of anonymous Internet communications early. With the growth of online communities, such as Geocities, Xoom and Angelfire, offering free Web pages to members, it has become increasingly easy for anyone with a grievance to reach a worldwide audience.

Attacks on Academics

With increasing frequency, anonymous attacks are being directed toward the academic world. A profile of the type of individual who engages in this type of activity will be provided. The academic victims include individual faculty members by way of "evaluation" Web sites posted by students and entire institutions attacked by students (Claremont McKenna College), faculty (The University of Louisiana), and alumni (Columbia University). Examples of each type of attack will be provided.

Legal Issues

An overview of the legal issues surrounding anonymous Web sites or "cybersmearing" will be provided, including a discussion of defamation, libel, and malice along with summaries of recent court decisions. In general, victims of such attacks have had little success in court, with attackers protected by the First Amendment. Although each case has its own individual issues, generally speaking, a number of criteria must be met before an anonymous Web posting can be considered illegal. First, statements must be presented as fact rather than opinion. Second, the statements of fact must be false. And third, the victim must show that the Web site posting was made with actual malice (that is, with reckless disregard for the truth).

Protecting Reputations

A good reputation is important to success; it deserves the same attention given physical, financial and intellectual assets. Reputation influences a university's ability to attract quality students and faculty, and to earn and keep the support of other stakeholders in the community and among alumni. Reputation is equally important to the successful career of an individual. Reputation has a direct impact on how well any organization or individual succeeds.

Four suggestions are offered for dealing with the increase in anonymous Internet-based attacks on the reputations of individuals and institutions in academia.

1. Know the Internet World

Search the Web regularly. It is time consuming, but any organization or individual that is not monitoring the Web could find serious trouble because of slanted, malicious, and libelous information. What an organization or individual does not know can hurt. Go to a site like DejaNews (www.dejanews.com) and use the UseNet search. The results might provide quite a surprise.

Know the Internet audience. Be aware of the places where this type of communication might occur. Understand the "netiquette" required to make the correct response to anonymous attacks.

2. Analyze your communication skills.

Stakeholders need to feel comfortable sharing both positive and negative feedback. If they do not, a communication skills audit may be in order. Actively encourage criticism. Criticism as an early warning system: it is better to hear it from your stakeholders directly than from an anonymous attacker on a Web site. Ask for feedback often enough that people take such requests seriously. Make it easy for people to provide the information. This can be done at regular meetings, at one-on-one meetings, or through requests on a Web site. Ask for feedback and then allot enough time in the meeting for people to really speak their minds. Thank them for their critical comments.

3. Prepare a Web disaster plan.

If an institution becomes a target for disinformation, a Web disaster plan should be in place. It might be advisable to have the infrastructure of a public relations Web site sitting on the server in case it is needed. Some organizations purchase potentially negative Web domain names such as "ihate...com" or "...sucks.com" as a preventive measure.

4. Negotiate.

Try to get to the source and negotiate some kind of compromise. Use legal action only as a last resort. Besides the difficulty in proving such a case, suing can be a very bad idea, giving the owner of the negative Web site even more attention. If the suit is lost, the individual or organization bringing the suit to court can look even worse.

Conclusion

It is increasingly important that individuals and institutions in academia understand the potential threat of anonymous Internet attacks. Supreme Court Justice Louis Brandeis wrote almost seventy-five years ago that the best answer to evil speech is more speech. Today, the Internet makes it possible for anybody to say anything. Instead of trying to silence someone on the Web, being proactive and speaking up in the same arena may be the best defense.

Implementation of Information and Communications Technologies in Australian Schools: The Perspective of the Principal

John Schiller
The University of Newcastle
NSW, Australia
john.schiller@newcastle.edu.au

Abstract: This paper will report on initial analysis of baseline data gathered from a survey of all elementary and secondary principals in the coastal Hunter region of New South Wales, the most populated state of Australia, in terms of their use of, and concerns about Information and Communication Technologies (ICT). Findings indicate that although most principals in the region are over the age of 40 and have been principals for more than 6 years, there are marked variations in their perceived competencies and use of ICT. Staff development, availability of technical support and maintenance assistance, and funding are major concerns. Interviews with selected elementary principals indicated greater familiarity with administrative uses of ICT than teaching and learning applications.

Introduction

Computers, the Internet and other information and communications technologies (ICT) can alter how schools are led, how teachers teach and how children learn. State governments in Australia have invested millions of dollars to prioritise integration of these technologies in schools; where the principals are major decision makers. Research has identified the principal as a key factor in successful adoption and implementation of change, yet little is known about the principal's role in implementation of Information and Communications Technology (ICT) in schools.

Background to the study

Recent Australian government priorities recognise that ICT plays an important role in schools, but without support of school leaders, particularly the principal, the educational potential of ICT may not be realised. Principals are expected to make complex decisions about how to integrate ICT into learning and teaching and assume a major responsibility for initiating and implementing school change through use of ICT but are themselves unsure of how to cope with these issues.

Educational change literature identifies factors in early and late adoption of educational change and points to the principal as a key facilitator in implementing educational change and school improvement (Fullan, 1996). Moreover, an 'Initiator' change facilitation style leads to greater implementation success (Hall & Hord, 2001).

There is also a growing field of literature on guidelines for school leaders about integrating ICT into schools (see Maurer & Davidson, 1998; Picciano, 1998). The role of the principal in supporting IT integration is seen as critical (Hoffman, 1996) but there is limited research to substantiate how these implementation strategies actually work (Michael, 1998; Riffel & Levin, 1997) and little Australian research on the role of the principal in the implementation of ICT although integration of ICT is current government policy. Finally, although examples of 'best practice' in ICT include a key role for the principal (Michael, 1999) there are no established criteria against which Australian schools can be compared.

Results of preliminary investigations

Research in the Hunter area of NSW, Australia by the author has shown that implementation of ICT in schools is complex and fraught with difficulties (Schiller, 1997). Identified issues of concern of school leaders included: access to and maintenance of appropriate hardware and software, apprehension about

personal computer use, providing appropriate staff development programs, and coping with strategic planning processes required to integrate ICT into teaching, learning and management practices. Concerns about these issues have increased recently in terms of pupil and teacher access to the Internet (Schiller, 1997) and as a result of government priority for increased ICT use.

Further, the Change Facilitation (CF) style of the principal (that is, the combinations of interventions they use), has been identified as a key factor in successful implementation of ICT (Schiller, 1997). Successful CF Styles of 'Initiator', 'Manager' or 'Responder' have been identified where 'Initiator' principals have greater success with innovation adoption and teacher success in change can be directly correlated with their principal's CF style. This style is located on a continua according to their 'concern for people', 'organisational efficiency' and 'strategic sense' (Hall & Hord, 2001).

However, findings from this research are limited by a small sample size, a focus solely on 'early adopters', a lack of comparative data, and lack of currency of some of the data due to rapid changes in ICT and recent changes in government ICT priorities (For example, by the end of 1999, all principals in NSW government schools were required to be familiar with computerised school reporting systems and to use a personal email address provided by the NSW Education and Training Department).

The preceding arguments lead to the following research study which is the focus of this paper. The following question guided this investigation. *How do principals facilitate the implementation of information and communications technologies (ICT) in their schools?* Specifically, What is the extent of principal use of and concern about ICT in elementary and high schools? How do elementary principals facilitate 'best practice' in ICT to improve teaching, learning and management processes in their schools?

This study is the first in a series to examine the influence of the principal in determining 'best practice' in using ICT in Australian schools. It was conducted in two phases involving quantitative and qualitative research methodologies. First, baseline data on the extent of elementary and secondary principal's use of ICT and their concerns about ICT, in the Hunter area of NSW was established. Second, the nature and impact of interventions of selected elementary principals in ICT implementation were examined.

The study

Phase One: Mapping the extent of principals' use of, and concerns about ICT in schools.

To determine the extent of principals' use of, and concerns, about ICT in their schools all principals in four local area School Districts of the NSW Department of Education and Training (n=288), the Maitland Diocese of the Catholic Education System (n=61) and the Independent schools in the Newcastle area (n=20), were invited to complete a questionnaire. This questionnaire provided baseline data to determine the extent of personal use and concerns about ICT by principals in one geographic area and allowed for comparison between groups of principals on criteria such as age, gender, school context, experience and perceived levels of computer competency.

The questionnaire has a variety of components including a Competency Rating Scale to determine use of ICT. All principals rated themselves on a series of competencies such as use of word processing, databases and spreadsheet applications, knowledge of educational and management software, and use of the Internet. Competencies were determined using a 4 point Likert-type scale ranging from 'not at all competent' to 'highly competent'. Responses to a series of statements about implications of ICT on management and learning styles were also explored using a similar Likert scale. Open-ended responses were sought to add 'richness' to the data. In addition, demographic data were collected.

This questionnaire was posted to the principals with pre-paid return postage. Follow-up letters and phone calls were used to improve the response rate. Competency data were analysed through SPSS statistical processes focussing on analysis of variance using a number of independent variables such as age, sex, experience, and size and type of school in relation to subcategory data from the questionnaire.

Phase Two: Mapping implementation strategies of elementary principals leading to 'best practice' in ICT Current implementation strategies used by primary school principals were examined as follows. Audiotaped interviews with District level Technology Advisors in government and non-government schools identified examples of 'best practice' in ICT and established a short list of elementary schools regarded as 'early adopter' and 'late adopter' in terms of ICT. The Technology Advisors rated the implementation success of each school. From this list of schools, a sample of 12 elementary schools was selected to provide 'early

adopter' and 'late adopter' schools so that examples of government/non-government, size and location of school, and initial/established use of ICT could be examined.

The principals of these schools were interviewed (on audiotape) using a semi-structured interview schedule piloted in preliminary studies (Schiller, 1997). This interview identified the extent and nature of principal interventions used to implement ICT in their schools, and focussed on; (a) initial use and current practices, (b) overcoming 'computer phobia', (c) perceived benefits/impediments, (d) changes in roles and responsibilities resulting from use, (e) policy and planning processes used, and (f) anticipated future implementation strategies.

From transcribed interview data, factors such as ICT access rate, leadership potential, ICT planning, staff development, and technical support, which are measurable indicators from the model of 'ICT Best Practice' (Michael, 1997), provided a framework for analysis and comparison between schools. This paper will report on preliminary findings from this Australian study.

Findings

Despite the length of the survey (11 pages) 217 principals (62%) responded. Many principals also included comments. This willingness to elaborate seemed to be in contrast to requests for information from principals several years ago when only a small proportion of principals commented on their role in ICT. In this study 66% of the respondents were male. Only 3.7% were below the age of 40 and 65% had been principals for more than six years. Most principals (93.5%) used computers at home and school. Most computers used by principals (88%) were PCs with 86.6% of all principals' computers connected to the school's network. Interestingly, 45.2% of principals use a laptop computer at work. Principals spend a lot of time working at a computer with 56.7% indicating more than 5 hours per week on their work computer and 60% indicating more than 3 hours per week on their home computer. Although 30% indicated slow typing speed, 60% stated that they could type 'reasonably well' while 10% stated they could type 'very rapidly'. The majority of use of both their work and home computers was in word processing, sending and receiving email and accessing the World Wide Web while construction of spreadsheets, databases and presentations (such as Powerpoint) was either 'never' or 'occasionally' used, either at home or at work. Only 20% of principals stated that they read spreadsheets 'frequently' at work with 40% indicating occasional use. 30% indicated that they had never read a spreadsheet. Many principals (35%) indicated never having used a digital camera or scanner but 58% indicated frequent use of WWW search engines.

As all principals in government schools have been provided with an email address in the last 18 months, it was not surprising to find that 51.6% receive more than 20 email messages per week and that the receipt of attached files is high with 45.6% indicating 25-50% of email messages with attached files and 20.7% indicating more than 50% of their email messages having files attached. Feedback during interviews indicated that this management of electronic information is becoming a major issue of concern to principals as they try to determine whether to save printed versions of attached files, who should take responsibility for filing them and where to locate them for appropriate and easy access.

Table 1 indicates responses to the question "how competent do you regard yourself in undertaking the following tasks?" and demonstrates wide variation of perceived competencies.

	Not competent	Basic competence	Reasonably competent	Highly competent
Use basic word processing	-	8	50	42
Use advanced word processing	13	22	36	29
Read and interpret a spreadsheet	7	34	40	19
Send email messages	2	8	47	43
Send attached files	13	21	30	36
Arrange email messages in folders	22	27	23	28
Use an URL to locate a WWW page	17	22	31	30
Create a Powerpoint presentation	41	26	20	13

Table 1: Perceived ICT competencies of principals

In response to the question "how have you learned about computers?" 86% stated that experimenting (or

playing) with a computer at home was 'very useful' while 70% said that playing with a computer at work was 'very useful'. 86% of principals stated that getting help from a colleague was very useful in helping them learn about computers. In contrast magazines and books were regarded as either 'useless' or of 'low usefulness'. Assistance from Technology Advisors at the District level and participation in workshops were both viewed by 60% of respondents as being 'very useful' whereas undertaking a course in computing was only seen by 39% as 'very useful' while 43% regarded courses as low in usefulness with 18% regarding them as 'useless'.

From a list of 15 concerns raised by principals during preliminary investigations for this study, five areas of concern were ranked highly. Staff development for effective use of ICT was the highest ranked concern with 89% of principals indicating concern. Availability of technical support and maintenance assistance was of concern to 85% of principals while funding for ICT (75%), the impact of ICT on changing approaches to teaching and learning (74%) and time for the principal to acquire new skills in using computers (73%), were also of high concern. Although not of the same level of concern, issues such as rapid obsolescence of hardware and software, how to facilitate implementation of ICT in the school, deciding on appropriate hardware/software and infrastructure, using ICT for management and leadership, equity and access to ICT, and appropriateness of ICT for teaching and learning, also ranked highly with approximately 54 – 63% indicating concern. When asked to nominate areas of ICT to be addressed over the next 12 months, the most frequently listed concerns of principals were staff development, technical support and coping with the impact of ICT on teaching and learning.

When asked to indicate extent of agreement to a series of 20 statements about ICT in schools on a 5 point Likert-type scale ranging from 'definitely agree', 'tend to agree', 'neither agree or disagree', 'tend to disagree' to 'definitely disagree', four groups of statements resulted in common patterns of agreement. In the first group there was strong agreement about costs being a barrier to effective implementation of ICT, that ICT has applications in all subjects, that a comprehensive school ICT plan requires regular updating and that the principal expected teachers to create a classroom environment where ICT is an integral component. In the second group of statements there were wide variations in the principals' levels of agreement. For example, there was a wide range of views on the adequacy of maintenance and technical information to support ICT in teaching and learning, on the availability of professional development being adequate for the needs of teachers, and whether the role of ICT in teaching and learning had been clearly identified at the school. The third group of statements about which there was strong agreement focussed on the principal. Principals strongly agreed that data re finance, student and staff records, timetabling etc must be available on their desk computers, that reading and responding to email as well as using ICT generally has increased the principal's workload but that personal use of ICT has helped them become more effective as principals. The fourth group of statements did not reflect any consistent levels of agreement in that a wide range of responses was indicated. The statements about the principal for which there was no agreement included 'I am sufficiently informed regarding incorporating ICT into the curriculum and into my role as principals', 'the role of ICT in administration has been clearly identified in this school', 'I have resources to effectively integrate ICT into my work as principal', 'I dread having to deal with ICT related problems' and 'using ICT saves me time'.

Interestingly, when asked to indicate the current stage of development in teaching and learning at their school on a five stage model starting at 'entry', and moving through to 'adoption', 'adaptation' (where ICT is integrated into traditional classroom practice), 'appropriation' (which focuses on cooperative, project based work using ICT as a tool where necessary) and 'invention', most principals classified their school at the 'adoption' stage (33.6%) or the 'adaptation' stage (49.3%). On the other hand they classified their schools' administrative use of ICT as at the 'adaptation' stage (44.2%) or the 'appropriation' stage (30%), with 7.4% indicating their school that their school was at the 'invention' stage of development in administrative uses of ICT with spread sheets and databases being used to simulate growth projections or digital images being used in projects which combine multiple technologies. The interview data also indicated that the 'early adopter' principals tended to explore a wider range of administrative uses of ICT including newsletter production, analysis of student and staff data, planning analysis, student outcome analysis and preparation of student reports.

Conclusion

Although these data were gathered from only a small geographic area of Australia and nothing can be determined about the 38% who did not respond to the survey, this study gives useful material for professional associations of principals to reflect on and for District personnel to consider. The data clearly demonstrate a major concern of principals about staff development of their teachers and of themselves in issues relating to greater use of ICT in their schools. In addition to the quantitative data demonstrating this concern, initial analysis of the qualitative data from interviews with 12 elementary principals in the second phase of this study clearly indicates a major concern that principals have in facilitating greater use of ICT at all levels in their schools. In interview, principals highlighted staff development issues. While stating that all teachers in their schools used ICT, they expressed concern about the wide variations in classroom use. They also commented on their own need for greater input and that more time and effort was needed to assist teachers integrate ICT into their classroom practices. They recognised that the support, recognition and expectations that they conveyed to their staff were critical in facilitating change. Preliminary analysis of data suggests that 'Initiator' principals, that is, those principals who intervene in ways that demonstrate their concern for people while focussing on organisational efficiency and exhibiting a strategic sense (Hall & Hord, 2001) are more likely to facilitate greater implementation success with ICT in their schools.

This study has demonstrated that principals in Australian schools now recognise the critical role that they play in facilitating the implementation of ICT in their schools to improve teaching, learning and administrative processes. However, the study has also demonstrated that there are enormous variations in their use of ICT, in their perceptions of their own competencies in ICT and in the challenges they see in facilitating greater use of ICT in their schools. There is no single factor to indicate which principal is likely to be more successful in implementation of ICT than another. But specific strategies for improving principals' understanding of their role in ICT are evident. Encouragement to explore ways of using ICT, for example, devising more appropriate file and data management strategies for principals, creating support networks among groups of principals and highlighting the critical nature of the principals' role in implementation of ICT in schools will all assist. Further analysis of data collected for this study will include analysis of variance between groups based on independent variables such as age, gender, experience, size and location of school. However, this study demonstrates that more research is needed to more clearly determine the extent and nature of the critical role of the principal in effective implementation and integration of ICT in schools.

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The School Administrator in the Technology Rich School: What New Roles and Skills Are Needed?

John Thompson, Ph.D.
Assistant Professor
Computer Information Systems
225 Chase Hall
Buffalo State College
1300 Elmwood Avenue
Buffalo, NY 14222
716.878.3531
thompsonj@bscmail.buffalostate.edu

Executive Summary

As technology is infused into schools, challenges are created for school leadership. Such challenges include understanding the total cost of ownership (TCO), ergonomics, Internet filtering, data warehousing, online learning, authorized use policies, and technology competencies for school administrators, to cite only a few. Administrators need to be aware of such challenges to ensure a proactive, not reactive, response. However, many school administrators have little, if any, knowledge about such issues and associated questions as:

- Digital divide. How can administrators reduce the digital divide within a school? Within a school district? Is there a single "right" way?
- TCO. What is the true cost of having technology? Does it impact on continuing to have Macs and PCs?
- Ergonomics. What is it and how does it impact on technology use in classrooms and offices? How is it connected to TCO?
- Internet filtering. What are the pros and cons of installing filters on your Internet access? What are the requirements of the CIPA legislation?
- Data warehousing. How can student assessment data be turned into information for decision-making and improving instruction? Why is the data already available not being used?
- Online learning. Is online learning (distance education) a coming force in K-12 schools? Is it already here? How can online learning be used for staff development and student learning?
- Technology planning. Who is involved in the planning process, and why? What is the purpose of such planning? Does it really make a difference?
- Technology integration. How can school leaders make certain that technology purchases will result in technology integration in the classrooms? What has to be done so that teachers, and other administrators, will actually use, and use effectively, computer technology in their daily routines?
- Technology competencies. What technology competencies should school administrators possess? How can school leaders acquire such skills?

Too many school administrators are unaware of these and other issues and attendant questions concerning technology in schools until the issues become problems. Once at the problem level, employee efficiency and morale, community support, and the school's educational mission can be adversely affected. Future expansion of computer use can be thrown into doubt. The first step in preventing the occurrence of

problems associated with technology infusion in schools is to gain awareness of the issues involving technology and then to learn simple methods to deal with such issues.

The main objectives/goals of paper include:

1. Identifying many of the issues that arise from the introduction and use of technology in schools.
2. Learning measures that can be taken by school administrators to deal with issues presented by computer technology in schools.

The overriding challenge for school leaders is making certain that all the new technology actually makes a positive difference on student performance. This difference can be realized either directly at the student desk or indirectly through increased efficiencies so that cost and timesavings fall through to the educational bottom line – classroom performance.

The workshop will consist of a PowerPoint presentation with active audience participation throughout. As a former building and district administrator, the presenter has personally experienced these technology challenges...and survived to tell the tale. Learn from his observations and experiences in introducing computers into school districts. Avoid letting technology challenges becoming issues and then problems for school leaders.

My qualifications and experience include being an Assistant Professor in Computer Information Systems at Buffalo State College where I teach graduate courses in educational technology. My computer experience dates from the early 1980s and includes leading efforts to overhaul technology in several school districts as a building principal, curriculum coordinator, and school superintendent. I have 20+ years of computer experience in K-12 and higher education, beginning with a Timex Sinclair computer and an early Apple computer. I also have chaired a technology committee of 20 school superintendents, taught a graduate course ("Computer Applications for School Administrators") at the University at Buffalo, and currently teach an online (Internet-based using Blackboard.com) course ("Computers for Educators") for the University of San Diego.

While a school superintendent, I was responsible for receiving a successful grant for a Goals 2000 award (\$103,000) to upgrade teachers' instructional technology skills, develop a professional teacher training network, and educate teachers and administrators in New York State's Learning Standards. We also obtained a New York State Learning Technology award (\$50,000) to integrate desktop videoconferencing in the classroom to restructure the teaching/learning process. Also, I directed a computer training facility for corporate clients at the University of Buffalo's School of Management, which trained 9,000 people in six locations over three counties in all aspects of personal computer use.

I have presented computer-related workshops at state and national conferences. In addition to my background with computers, I have enjoyed a wide-ranging career in many other aspects of education and training. My K-12 career included being a school superintendent, principal, curriculum coordinator, and special education, elementary, and secondary classroom teacher in urban, suburban, and rural school districts. My government experience included being the director of training for Georgia and Illinois State governments (70,000 employees each), leading the implementation of a total quality management (TQM) initiative in a 1,100-employee state agency, and facilitating strategic plans for another state agency and a municipality. I also operate my own consulting and training business.

My professional memberships include educational organizations such as the International Society for Technology in Education (ISTE), New York State Association for Computers and Technologies in Education (NYSC&TE), Association for Educational Communications and Technology (AECT), Computer-Using Educators (CUE), and American Association of School Administrators (AASA). I also served on the New York State Board of Regents Task Force on Technology and Infrastructure.

Project Management: From the Perspective of a Graduate Student

Ling Wang
Department of Curriculum and Instruction
Purdue University
United States
Wang23@purdue.edu

Abstract: This article is about the project managing experience of the author with the VisionQuest[®] Project in the Educational Technology program at Purdue University where the author is pursuing her doctoral degree. The article contains three sections: (1) a brief description of the VisionQuest[®] Project, (2) project management methodologies adopted by the author in the position of project manager, and (3) from the perspective of being a graduate student, the benefits and challenges of this experience for the author, as project manager.

Project Background

Technology integration is not achieved by merely providing teachers with access to technology. Research (Marcinkiewicz, 1996; Albion, 1999) has shown that availability and access are not the sole determinants of technology integration. The use of technology may be associated more with teachers' beliefs about teaching and the value teachers assign to particular uses of technology. The purpose of the VisionQuest[®] Project is to help current and future educators envision and achieve technology integration by providing access to electronic models of technology-using teachers. As an extension of the VisionQuest[®] CD-ROM and as the second step of the VisionQuest[®] Project, a Web-based course was developed to engage in-service teachers in conversations about technology use. In this course, teachers are brought together as an electronic community to mentor and mutually encourage each other by talking about their pedagogical visions, aspects of classroom organization, and assessment practices.

When the author assumed management of this project, the project team was in the middle of designing the on-line course format for VisionQuest[®]. Some course lessons needed to be designed from scratch while other lessons needed to be revised. The tasks included the following:

Task Orientation	Potential tasks for the current stage of the project; likelihood that the tasks will be completed by the end of the current semester; tasks from the previous stage of the project to carry over and be given extended deadlines and provide rationales.
Task Selection	Determine the final list of the tasks to be completed by the end of the current semester; set a deadline for each task; estimate hours to be spent on each task.
Human Resources Relocation	Staff the tasks and name a contact person for each task; ask the contact person for each task to distribute the deadline information and estimated hours information to members working on the same task and collect feedback from them; meet with contact persons and revise deadlines and estimated hours.
Organize Meeting Sessions	Set up meeting locations; inform project members of the time, location, and content of each meeting session; prepare agendas for each meeting session; chair the meeting sessions and see to the completion of the planned tasks on agendas.
Checking Progress	Revisit the deadlines as they approach; check the progress with contact persons; analyze problems if any; re-set the deadlines, if necessary (after consulting with the two directors); assess the completed tasks.
Reporting & Projecting	At the end of the current semester, write up a report to evaluate the progress, the teamwork, and working environment; project tasks for next semester.

Table 1. The Project Manager's Tasks

Project Management Methodologies

Effective project management is the key to the success of a project. In order to accomplish the role of project manager in a satisfactory way, effective methodologies of project management are crucial. When

managing the VisionQuest[®] Project, the author has adopted two specific methodologies: a. Goal-Oriented Project Management (Ami, 2000), and b. Just-In-Time Project Management (McDowell, 2001). The following are the benefits of this project from the two methodologies.

- Clear and fast identification of the project's weak links, i.e., those potential for improvement.
- Focusing management efforts in a way that would best contribute to the project's overarching goals.
- Allowing system integration and improving the information flow among project units.
- The project's decision-making process was well-structured and based on complete information.
- Risks and problems were detected during early stages of development and production.
- "Control center" assimilation enabled a significant reduction in "time-to-market", i.e., marketing the VisionQuest[®] CD-ROM and the on-line course.

Benefits and Challenges

The involvement in the VisionQuest[®] Project in the role of project manager has been very beneficial to the author. First and foremost, this project gave the author a sense of what "real-world" management is like. Because it is a real project in progress, every step the team made eventually played a significant role in the project outcomes. In addition, this experience is a good component to enter the resume and will increase the opportunity to "sell" the author well when the author pursues a career search. Specifically, this experience is critical to and helpful in the development of the following skills:

- Written and oral communication skills
- Instructional design skills
- Technology skills
- Teamwork skills
- Time management skills
- Organizational skills
- Problem-solving skills
- Decision-making skills

On the other hand, the amount of work of project management is overwhelming. There was a large amount of work involved at the stages of task analysis and selection as well as coordinating with members on their individual task assignment. What made the work seem more time-consuming is the fact that the author had to figure out solutions whenever a likely problem came up. The author found herself jotting down things whenever they occurred to her and communicating with members whenever she needed to disseminate information to them or collect information from them. It was by no means a job that you can put in a certain time slot of a week and get it done for the week during that time; it was like a job "haunting" you 24 hours and 7 days a week?

Conclusion

In managing the VisionQuest[®] Project, the author saw herself grow in abilities to coordinate tasks and team members and make quick responses to and decisions on problems whenever they arise. The implications of the author's experiences for other graduate students would be that, before graduation and stepping into the real world, it is very beneficial to locate an opportunity in which they can exercise some of those "required" skills in order to well prepare themselves for future career pursuit.

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